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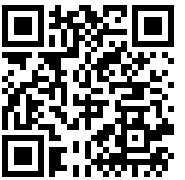

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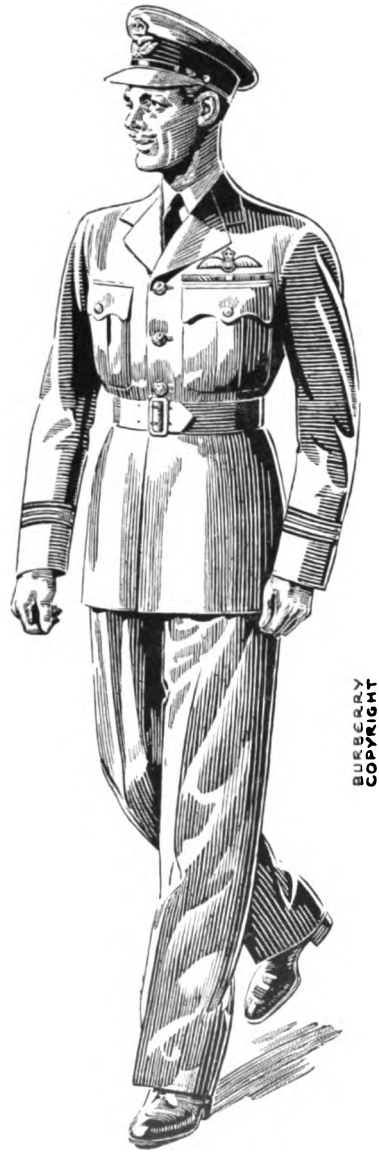

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THE ROYAL AIR FORCE QUARTERLY

AND

COMMONWEALTH AIR FORCES JOURNAL

EDITOR

GROUP CAPTAIN A. H. STRADLING, O.B.E., R.A.F.

Assisted by an Advisory Committee of Members of the R.A.F. and Air Forces of the Commonwealth

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COVER PICTURE

THE Secretary of State for Air, when presenting his Air Estimates, informed the House of Commons that we had under development a twin-jet bomber capable of a speed approaching 500 m.p.h., and that orders had been placed for its production.

Our picture shows the "A.1" Bomber, with which the R.A.F. is to be armed. Built by the English Electric Company and powered by two Rolls-Royce Avons, it has completed successfully its first test flight.

The "A.1" is still on the "secret list" and details of its performance are not yet available for publication.

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With the appearance of the July issue of "The Royal Air Force Quarterly and Empire Air Forces Journal" we have an old friend with a new look.

The Quarterly can be of great use to everybody in the Royal Air Force as a medium for the expression of their views and experiences; and I am certain that among us is a fund of experience sufficient to keep the Quarterly extremely lively for all time.

I sincerely hope that the Quarterly will continue to serve as a forum for the exchange of ideas among all past and present members of the Royal Air Force and the Commonwealth Air Forces.

Marshal of the Royal Air Force.

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EDITORIAL

AIR POWER—WHAT IS OUR POLICY?

IN the debate on Defence much anxiety was expressed about Britain's air strength. The possible reasons are worth considering. In a future war the potential aggressor would try to avoid the danger of a long-drawn-out struggle, because the new Western *bloc* could, given time, mobilize immensely powerful forces.

To avoid this it is likely that an overwhelming lightning attack would be made on Britain, in an attempt to deprive America of this forward base. Obviously such an attack would come from the air. By an unexpected onslaught the aggressor would hope to immobilize a large part of our Air Force on the ground; then by sheer superiority of numbers to destroy the remainder in air battle and achieve command of the air at the very outset of her surprise attack.

With large fleets of bombers, with rockets and other projectiles, she would then be free to devastate large areas, preparatory to the landing of an armada of airborne troops. Masters of the air, attacks on our Fleet would be devastating, and the attainment of at least local command of the seas would not be difficult when aided by extensive submarine attacks, giving her the necessary freedom to reinforce her airborne troops with her vast land forces. She would hope, by these means, to make this country capitulate in a very short space of time.

We can no longer rely on our past method of losing the first battles but always winning the last one. In the war envisaged, the first battle *will* be the last one; there will be but one—the battle for command of the air. Hence our anxiety that our Air Force shall be strong, efficient and ever ready to defend us against a surprise attack, and this state of readiness must be maintained as long as the danger threatens.

The cost of such an Air Force will necessarily be great and throw a strain on our national resources. It is the proportion of our resources which is being allocated to this purpose which gives rise to anxiety. Without going into the actual details of the strength of such a force, it is enough to suggest that it must be a suitably *balanced* one of fighters and bombers.

A family sitting in their garden, when suddenly attacked by an unusual number of wasps, know that the nuisance is not abated by "swatting" those in their locality. The attack will continue, despite the few dead ones in the jam, etc., and they will soon be forced to abandon their garden for safety elsewhere. Knowing this, the more agile members of the family will "swat" those in the immediate vicinity, while others seek out and destroy the nest or nests from which they come. Only then will peace reign once again.

Air warfare demands similar action. Our fighters must be capable of intercepting and destroying in the air the enemy bombers and their fighter escorts; but we must also have bombers whose performance will enable them to break through enemy opposition, possibly with the assistance of fighters, and reach far-distant targets which, with electronic devices, they can bomb *accurately* at high speeds. A modern bomber force is vital for destroying the sources from which all types of air attack on this country emanate; their aerodromes, aircraft and rocket factories, their stocks of bombs, projectiles and fuel, and for immobilizing lines of communication.

The battle for the command of the air would be of primary importance, but our Air Force would have to be strong enough to undertake additional tasks.

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With such inadequate armies on the Continent in comparison with those of the potential aggressor, air action would be necessary to prevent them being overwhelmed by superior numbers. The size of our Air Force would not permit the diversion of large bomber fleets for this purpose, therefore the urgency of the situation would necessitate our using atomic bombs for this purpose at the very outset of war.

The Navy would also require the immediate co-operation of the Air Force, not only to give air cover but to reduce the menace of underwater attacks from the enemy's many new submarines, and give reasonable freedom for our Fleet to blockade the aggressor and safeguard our seaborne supplies.

It is unnecessary to give further instances of the employment of air power; these alone clearly indicate what an immense responsibility lies—yes, lies at this moment—on the shoulders of Britain's Air Force.

What is our defence plan to meet these contingencies? Is it adequate for our country's needs?

Whatever it is, the plan must bear relation to Britain's available resources. The Government's veil of secrecy makes an estimate of their air-defence policy difficult, but its broad direction is becoming dimly visible.

The number of our jet fighters is to be doubled, and the first of our jet bombers has proved satisfactory in its trials. We are in a transition period in our bomber force without a doubt, but fortunately this weakness in bomber strength is covered to some extent by the large strategic bomber force which America has developed and is ready to hand until new British bombers are available in adequate numbers.

But until Western Europe also possesses a force of modern medium bombers —the tactical weapon of defence—it cannot be said that the West has a balanced system of air defence.

What of the man-power position of our Air Force? With a Regular strength of 110,000 airmen, the R.A.F. is some 70,000 short of its target. The total strength is now 234,000, of whom more than half are National Service men. These being only semi-skilled men, the situation is far from satisfactory.

The fact that our Royal Auxiliary Air Force has only reached 12 per cent. of its intended strength merely adds to our anxiety. The serious deficiencies in the skilled trades of our Air Force and their effect on the maintenance of aircraft and consequent reduction of flying hours, are not helpful to the morale of the Royal Air Force or to our confidence in the preparedness of our country's first line of defence. Whether any constructive proposals will come from the recent conference between the architects of today's R.A.F. and the controlling powers of the nation's skilled workers remains to be seen. Any recommendations which emanate therefrom which would remedy this grave weakness in our defence should have the immediate and whole-hearted support of the nation. That it is vital for the removal of the present anxiety about Britain's air strength must be obvious to all who believe in defending ourselves from the possible aggression that still threatens us and who desire to remain free to live their own way of life.

The nation is still uneasy about its air power, and it rests with the Government to convince us and our allies that at least one obvious defect, the deficiency in skilled tradesmen, is being remedied and remedied without further delay.

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THE DEVELOPMENT OF BOMBING

By Air Marshal Sir Robert H. M. S. Saundby, K.B.E., C.B., M.C., D.F.C., A.F.C.

IT is perhaps significant that the earliest recorded example of the use of air power was a bombing incident. You will remember that Sinbad the Sailor lost his ship from the attacks of a roc, a giant bird which dropped boulders on it from a great height. I have often thought that this story is a remarkable piece of prophetic imagination. The persistence and malevolence of the bird, the helplessness of the sailors, the confusion in the ship, and the inevitable outcome of the attack—these were paralleled on many an occasion during the last war. The author of the tale certainly had a clear notion of the decisive effect of the third dimension in war.

But when mankind did, in fact, learn how to make a machine fly it is curious to note how reluctant were the military authorities to admit that a new offensive weapon had been born. Marshal Foch is on record as saying: "The aeroplane is good sport, but for war it is useless." The Germans apparently regarded aircraft as a form of transport, since they were placed under the control of the Inspector-General of Motor Transport. In this country we had a clear, if limited, idea of the way to use aircraft in war. They were regarded, first and last, as instruments of reconnaissance. By 1915 they were also regarded as invaluable for artillery spotting and control. Gradually air fighting came into being, for the purpose of protecting the army co-operation aircraft. This was done by arming the fast single-seater reconnaissance types with machine guns.

Individuals, both in the R.N.A.S. and R.F.C., experimented with small home-made bombs and modified shells, dropped by hand over the side. Who dropped the first such "bomb" I know not, but I think it is clear that the Germans first officially developed the idea of sighting and dropping bombs from aircraft. This development was particularly applied to their Zeppelins. By 1916 all the belligerents had realized something of the possibilities of bombing from the air, and were designing equipment for the purpose. Progress was, however, slow, for the older Services foresaw what might happen and instinctively sought to control and suppress the offensive character of aircraft. Their general line was to emphasize strongly the value and, indeed, the indispensability of aircraft for reconnaissance and gunnery control, while belittling the possibilities of the direct air offensive by means of bombing. In this policy they were aided by those who, carried away by their visions, painted exaggerated pictures of the new air age, and claimed that navies and armies were already obsolescent. Aided by the natural conservatism of our people, it was easy to refute such statements and, at the same time, to stifle or ignore the real facts of air power. Indeed, the general acceptance of the true meaning of air power has been hampered from the beginning by enthusiastic writers who have over-stated their case, and so played into the hands of those interested in keeping air power in a strait waistcoat.

In 1918, however, the Royal Air Force came into being, and soon afterwards the Independent Air Force, under Major-General Trenchard, began its operations against industrial targets in Rhineland-Westphalia. Its aircraft had a radius of action of little more than 100 miles, and carried some 500 lb. of not very effec-

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tive bombs. Nevertheless, this force produced positive results, and undoubtedly made some contribution towards the German collapse in the autumn of 1918.

The name "Independent" Air Force was not a happy one, since it gave rise to an impression, carefully exploited by the opponents of air power, that air bombing was a separate operation, unconnected with the main war effort. It was stigmatized as a "private war," having no relation to, or bearing on, the operations of the army in France and Flanders.

It was indeed fortunate that war experience had brought about the fusion of the Naval and Army Air Services in April, 1918, into a new third Service. This took place none too soon, for the war ended little more than six months later, and such a fusion would have been impossible once the war was over. As it was, Lord Trenchard had to fight hard for years to prevent the Royal Air Force from becoming the victim of a judgment of Solomon. Perhaps none other than he could have succeeded, but, in any event, the nation owes him an immeasurable debt of gratitude. For if the Air Force had been divided there would have been no Air Staff and no R.A.F. Staff College. There would have been no Fighter Command and no highly organized and well-trained air defence of Great Britain. It is as certain as such things can be that we should not have survived the German onslaught in 1940.

Even if by some miracle we had survived there would have been no Bomber Command capable of carrying the offensive into the heart of Germany, and preparing the way for eventual victory.

In the first few years of peace after 1918 the Armed Forces were sharply cut down. The Army was reduced to a point at which it could not effectively control the new areas—Palestine, Iraq and Transjordan—for which we were now responsible, in addition to its perennial tasks in India, Aden and elsewhere. A troublesome rebellion in Iraq in 1920 brought things to a head. The public in this country were unwilling to sacrifice the lives of our soldiers and pay vast sums of money for the doubtful privilege of exercising the mandates over these territories entrusted to us by the League of Nations. The search for improved and less costly methods led to a proposal, vigorously supported by Mr. Winston Churchill, for the use of the new air weapon in the control of undeveloped countries. The method was tried first in Iraq in 1922, and was an immediate success. Casualties on both sides were soon reduced almost to zero, law and order were largely reestablished, and the cost of our mandate reduced to a fraction of its former figure. Complete success in Iraq was hampered by the need for employing the Iraq Army in preparation for the time when we should hand over control to the authorities in Baghdad. In the Aden Protectorate air control was instituted in 1928, and has been employed ever since. It has been a complete success, and brought about a peace and order previously unknown, at a very small cost in lives to both sides, and marked financial economy.

On the North-West Frontier of India air control was never given a trial. It was used occasionally in some limited area, but its success soon led to its firm restriction. There were too many vested interests on the North-West Frontier for the new method to have much chance of showing what it could do.

But the main interest for us in these novel arrangements is their effect on the development of bombing. It was essential to the system that aircraft should be able to pick out a village, often in imperfectly mapped country, and bomb it accurately. Sometimes it was necessary to select the house of some lawless chieftain, and destroy it without too much damage to its surroundings. Thus a considerable emphasis was placed upon accurate bombing, admittedly from rather low heights, and upon navigation, map-reading and map-making. In addition, the

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scheme required mobility, in the sense that air units had to move at short notice to unoccupied landing grounds and promptly begin operations.

All this was very good for the Service, and indeed, looking back, I do not believe that, without it, we could have solved our problems in 1939-45 as we did. It gave us a real job to do, with live bombs, sufficiently difficult to encourage a high standard of training and morale.

But, like everything else, air control had for us its dangers and difficulties. It led to the production of "general purpose" types of aircraft, useless for European warfare. It caused us to give less consideration than was proper to the problem of high-altitude bombing. And it helped to induce a belief that targets could be successfully identified and attacked by visual means alone.

These tendencies, fortunately, were to some extent corrected by developments in the high-altitude bombing of ships. All through the years of peace there was much argument as to the outcome of air attack on warships. The Navy persistently discounted the dangers of bombing and airborne torpedo attack. The Air Force as steadily maintained its view that such attacks could and would succeed. The natural result of this conflict of views was the staging of periodical trials. These mainly took the form of tests of bomb penetration and performance against stationary battleships, and tests of bombing accuracy against the radio-controlled battleship *Centurion*. This encouraged research into the problem of bomb design and high-altitude bombing, but did nothing to direct thought towards the problem of finding the targets by other than visual methods.

Thus it came about that we began the last war with ideas of finding and hitting the target that were far from clarified. At first we hoped to bomb by daylight, but the strength of the enemy's defences, which caused us severe losses when we attempted to bomb his warships soon after the outbreak of war, made us decide on a policy of night bombing. Here our only contribution to the problem of finding the target was the provision of parachute flares. Practical experience soon showed, however, that at night even the best bomb aimers, dazzled by searchlights and misled by smoke screens and decoy lighting, could seldom find their targets.

This possibility had been dimly foreseen before the war, and requirements had been issued for "blind-bombing" devices using the new technique of radar that had proved so successful in the solution of air defence problems. Two methods were eventually adopted. One depended upon control of the aircraft from two ground stations in this country. This proved very accurate up to a range of about 400 miles, but, owing to the limitation on the number of ground stations, the density of bombing by this method was very restricted. It was therefore chiefly used for dropping accurate "marker" bombs, to provide an aiming point for the main force. A fresh "marker" bomb could be dropped every few minutes, and so the target could be kept continuously marked. The other method involved carrying in the bomber aircraft a device which enabled the crew to see, on a screen, a rough indication of the landscape below. This depended on the varying degrees of reflection of a radar wave by water, open country and built-up areas. It was of great value for navigation and, in conjunction with the dropping of large numbers of parachute flares in the target area, enabled specially trained crews to identify and mark the aiming point.

It will be seen that both these methods involved the use of "marker" bombs, which suggested the employment of units specially trained in the technique of target finding and marking. These units were centralized in a Pathfinder Force, and manned by selected crews, whose duty it was to find and mark the aiming points for the main force.

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This method, although successful, had one great drawback. It was impossible for the Pathfinder Force to mark the aiming point for more than a limited period, and thus a new and very important factor entered into the planning of bombing operations. If the Pathfinder Force could mark the aiming point for, say, twenty-five minutes, it was necessary for the main force to arrive immediately after the marking had begun, and complete the attack before the illumination produced by the marker bombs had died away. This introduced very complex problems of navigation, routing and concentration in time and space of large forces. Obviously the ideal is for each bomber aircraft to carry an accurate and foolproof blind-bombing device.

The development of bomb sights during the years of peace had been along two lines, but both the course-setting and automatic bomb sights required the aircraft to approach the target at a constant speed and altitude, along a straight course of considerable length. These are, of course, the ideal conditions for the A.A. gunner, and it soon became clear that we must develop a bomb sight which allowed a greater degree of tactical freedom in the approach to the target. This was achieved by means of a new sight, involving gyro-stabilization.

Between the wars there were two rival theories in the field of bomb design, which can briefly be summed up as "blast versus fragmentation." The German attack on this country in 1940 settled the controversy. It is much easier to judge the efficacy of bombs when you are at the receiving end. So "blast" won the day, and we redesigned our series of bombs in the light of what we had learned by bitter experience. Fragmentation was retained only for the limited purpose of anti-personnel bombs for use by tactical air forces.

Certain special bombs were also produced. Chief among these were the very heavy bombs designed primarily to penetrate the concrete roofs, many yards thick, with which the Germans protected their submarine pens. These bombs were produced in two sizes, weighing about five and a half tons and ten tons, and not only succeeded in shattering the pens but proved useful for many other purposes. It was an attack with five-and-a-half-ton bombs which eventually destroyed the *Tirpitz*, after she had survived many attacks by other weapons.

So much for the development of equipment. Now let us look at the part played by bombing in the last war—at its objects and the extent to which they were achieved. With the winning of the Battle of Britain the defensive phase, with which the war began, had ended. This, indeed, and not the Battle of Alamein, was the true "end of the beginning." With the defensive phase behind us, it was necessary to plan some strategic offensive, which would open the second phase—the phase which would, eventually, lead to victory.

Only two courses offered: a bombing campaign against Germany, and a land offensive against Italian colonial forces in North Africa. A bombing campaign, if successful, would contribute very substantially to our eventual victory, while it is doubtful if as much could be said for the campaign in North Africa. However that may be, we chose both alternatives. I venture to suggest that, had we known as much about bombing then as we do now, we should have concentrated the bulk of our effort behind the strategic bombardment of Germany. But bombing campaigns were new ideas—they were guesswork—and Hitler's attempt against us had failed. It was therefore but natural that the War Cabinet should hesitate, at such a critical moment, to back an unknown horse to win.

The task given to Bomber Command was the progressive destruction of German industrial potential, communications and will to war, with the object of bringing about conditions favourable to a resumption of the offensive by the Red Army, and the invasion of the Continent by the Allied land forces. For this

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task the strength of Bomber Command, in 1941, was quite inadequate. After an uphill struggle, made more protracted by the huge diversion of effort caused by sustaining a campaign in North Africa with communications via the Cape, the bomber force was gradually built up to a strength at which it could begin to carry out its directive. By 1942, however, the skill and tremendous tenacity of our aircrews, whose morale during their long struggle against odds never wavered, commenced to throw the enemy on the defensive in the air. By the beginning of 1943 the strategic bombing campaign, in co-operation with the United States 8th Air Force, began in earnest. In less than one year German industry suffered very heavily and Germany was completely defeated in the air. As a consequence, she was thrown on the defensive on land and sea. Early in 1944 the bomber forces were switched to the preparations for Operation "Overlord," the invasion of the Continent by sea.

The problem was essentially simple to define. We had to smash the enemy's communications so completely that we could build up our forces on the beach-heads, using the sea communications, faster than he could build up his forces against them, using the railways and roads.

The bombers successfully accomplished this, and, the troops once landed, proceeded from time to time, as requested, to blast the enemy defences and strong-points. Perhaps their most remarkable achievement in this direction was the reduction of the Channel ports. The Germans realized the importance to us of these ports, and left behind in them strong garrisons, with orders to hold out to the end. After heavy air bombardment of their defences, Calais, Boulogne and Le Havre were all taken within a few weeks by the Allied land forces with hardly any loss. More than 20,000 Germans were captured in these strongholds.

The bombers were then turned on to the task of destroying the enemy's synthetic-oil plants. This was accomplished and, by the end of 1944, the Germans had hardly any oil stocks anywhere. Their air forces, indeed, were made almost impotent through lack of fuel.

The end of the war came with the dropping, in Japan, of a new weapon—the atomic bomb. The effect of this is to make one aeroplane capable of the destruction caused by a successful attack by some 500 Lancasters in 1945. With a large supply of atomic bombs the extent of the destruction of which air forces are now capable is beyond our powers of imagination. It has caused many people to believe that modern civilization could not survive the effects of a third world war.

Whether this be so or not, it is certain that air bombardment is now by far the most powerful offensive weapon at the disposal of mankind. It is no longer possible to doubt that, in any future war between major powers, it will play the decisive part. Air defence, civil defence and the methods of dealing with the effects of radio-activity are now subjects of first importance. Reality today has reached far beyond the wildest claims of the air enthusiasts, whose prophetic writings, published too soon, did much to discredit the legitimate claims of air power.

In the words of Mr. Churchill, air power is now the dominant factor in warfare, and navies and armies, though still essential, must play a subordinate part.

[NOTE.—*In our next issue (October, 1949) a further article by the same author will be published, dealing with the probable future development of guided missiles and atomic bombs, and their influence on the art of war.*—ED.]

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A BOMBER STATION TODAY

Its function and its problem

By Group Captain R. C. M. Collard, D.S.O., D.F.C.

If we are to consider the life of a present-day Bomber Station there is one factor which must be understood at once: namely, that a Bomber Station works all round the clock. Unless this is appreciated by all whose duty lies with bombers an atmosphere of unreality will result. For the purpose of this article it will be sufficient if the reader appreciates it, and to persuade him to do so it will be necessary simply to state two facts. First, at least one-third of the flying in bombers must be done by night. Secondly, the duration of an operational training flight in the current British heavy bomber is from five to ten hours. At either end of such flights a servicing operation must take place and aircrews must be briefed and interrogated. It will be seen therefore that only a proportion of these tasks can be carried out within the narrow limits of the routine day of 8 till 5. Those who work by night will normally have time off during the next day, though many, on balance, work far longer hours than were visualized by many of our planners. But the point is that the organization must function continuously, and the routine working hours are little more than a framework on which to hang the administration of the station.

A Bomber Station, like Cæsar's Gaul, is divided into three parts—Flying, Administrative and Technical. The Flying Wing comprises the squadrons, which in turn consist of aircrew and those technical airmen who carry out the first-line servicing of the aircraft. The Administrative Wing includes the secretarial, equipment and medical elements and all the domestic personnel; it carries on the basic administration of the whole station. And the Technical Wing, which has all the technical sections and services, including motor transport, is primarily responsible for the second-line servicing of the aircraft. At the head of each of these divisions is a Wing Commander responsible to the Station Commander, who sits in theoretically splendid isolation at the apex of the pyramid.

This system, which has been developed throughout the Royal Air Force, is almost perfect in theory and does indeed work very well in practice. It has its dangers. One of them is that, in its anxiety to relieve the Station Commander of all detail, it may divorce him from the essential life of the station. In a community such as we are considering, morale and consequent efficiency depend so largely on detail. Badly cooked food means discontented airmen; so does a dirty N.A.A.F.I.; so does a bad laundry. Some little thing like children having to wait in the rain for the school bus, or bad coal for married quarters, will upset the families and thereby the husbands. And if those who are directly responsible for these matters fail, then the Commanding Officer must look into it himself; the mere issuing of orders to those who have failed already is unlikely to meet the case. And because the life of such a community—and it is the whole life, not just the working hours—has so many sides, the amount of detail which needs looking into will never be slight. So the Commanding Officer's isolation must not be too splendid.

Then there is a danger lest the three wings should become too watertight. The large degree of specialization adopted in the Service today tends inevitably to the creation of narrow channels stretching down from the Air Ministry through commands and groups to units, subordinate dealing with subordinate to the

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A member of aircrew. Those who face risks in peace and dangers in war

The ground crew of a bomber station. "Bombing-up" a Lincoln Bomber

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exclusion both of the appropriate superiors and the broader considerations of policy. It is no particular criticism of the Technical Branch to say that this is a special failing of theirs; technical men always prefer to deal with their own kind and it is understandable. Flying men, too, are apt to be exclusive and sometimes arrogant. But it is essential that the Flying and Technical Wings work in the closest co-operation and sympathy, otherwise mutual distrust and poor aircraft serviceability will result.

Those in the Administrative Wing, too, are liable to become so bemused by study of regulations and the never-ending flow of paper that they fail, both literally and figuratively, to get enough fresh air. They sometimes forget, in their vital task of administering the unit, that the sole aim of the whole organization is to put aircraft into the air. And here we come to the problem which, in one form or another, confronts all those concerned with the running of an air force.

A Bomber Station reflects, in microcosm, almost all the activities to be found in any community of human beings. It has to live, and so has to feed itself and take steps to clothe itself; it has to arrange for work, for sleep and for recreation; it has to keep itself clean and guard its health; there is room for culture and a need for it; finally, it has to defend itself. But none of these things are ends in themselves. This particular community has one clear purpose, without which its whole existence is pointless. And this purpose is to enable aircraft to take the air with their crews and train to destroy Britain's enemies. This aim might be stated in many different ways, but whatever circumlocution may be indulged in the logical man is driven back to the one crucial aim, to keep flying. And in war time it is little changed; simulation becomes harsh reality, that is all.

The trouble with an air force is, of course, that only a small minority actually do the flying, and the danger is that a high proportion of the personnel on a station may fail to see the aim clearly. The airmen who perform the first-line servicing and prepare the aircraft for flight should indeed have little difficulty in seeing the point; those engaged in repair and inspection and in the workshops will have more difficulty; while those considerable numbers employed on clerical, store-keeping, disciplinary and domestic duties may understandably miss the point altogether unless, by proper emphasis, it is continually brought home to them. Here is a problem of the first magnitude and on its solution depends the moral effectiveness of an Air Force unit, no matter what its material condition may be.

The problem demands a twofold solution. First, each man must be brought to appreciate what is the aim, namely, to get the aircraft into the air and operate them effectively while they are there. Secondly, he must be shown how his particular job, however seemingly obscure, tends towards the achievement of that aim. It is not indeed difficult to trace the connection between the efficient discharge of any particular job on a station and the final achievement of the aim. But individual exhortation has no real place in a fighting unit; it is the organization, the emphasis, the whole atmosphere of the place which must be such as to focus the efforts of all towards the desired end.

The present writer is convinced that, to achieve this, the whole station must somehow be made to revolve round the aircraft; rather in the way that, in simpler days, a good cavalry regiment revolved round its horses. The aircraft form the hub of the station's activities and should appear as the symbols of its purpose. The aircrews must not be looked upon as privileged beings apart, who contribute nothing to the conduct of the station and whose duties are pure pleasure. They are, in fact, the last links in that long chain, stretching back to the maintenance units and depots, by means of which an aircraft is turned into a weapon of war.

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They are not more or less important than the rest, but the risks attendant on their duties in peace and the dangers which they must face in war entitle them perhaps to a little more in the way of privilege. And it is well to remember that flying bombers is today, and will be still more in the future, an exacting and arduous task calling for a high degree of skill and knowledge; in war it brings that mixture of boredom and anxiety which is among the most wearing of human emotions.

This conscious direction of effort towards the common aim is, largely, a matter of emphasis and atmosphere, but organization has its part to play. It is important that an airman employed on first-line servicing should so far as possible be identified with a particular aircraft, so that he may acquire an interest and pride in it. The system of planned maintenance now practised in the Royal Air Force, being based on statistics, has, in my view, tended to produce a scale of manning which pays insufficient regard to this point. It is indeed the opinion of many that planned maintenance ceases to be profitable when applied to front-line servicing; that a more liberal manning scale permitting the allocation of a complete ground crew, with an N.C.O. in charge, to each aircraft would justify itself by stimulating enthusiasm and so increasing productivity. However that may be, under present arrangements some ingenuity is required of flight commanders and technical officers to foster that identity of men with aircraft, and consequently of ground crew with aircrew, which is eminently desirable.

Roughly a third of the personnel of a Bomber Station are held on the strength of the flying squadrons. Internal postings lie within the competence of the station and so airmen can be moved freely from one unit to another. But it is important that this should not be done if it can be avoided; the squadron spirit represents something of inestimable value to the Service, but clearly it depends on some

[Photo: Air Ministry Crown Copyright Reserved

Teamwork. The ground staff having completed their part, the aircrew of 44 Squadron prepare for a flight to Southern Rhodesia

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degree of permanence. The squadron commander must be able to feel that his officers and men are his own and will not be removed from him just to make the station manning records look tidy.

The squadrons will each be commanded by a squadron leader. Each of these officers is a key man on a Bomber Station. He has many advantages. He is at the head of a small, compact fighting unit; he will be senior enough to command respect if he deserves it and yet young enough to be "one of the boys." He is relieved by the station organization of most of the drearier details of administration. He will have opportunities of getting his unit away on detachment and so enjoying a satisfying feeling of independence. But his task is not easy; command of a fighting unit never is. If aircrews are short he will have difficulty in maintaining the identity of his squadron; if ground crews are short he will have difficulty in getting his aircraft into the air. He will often feel that the station administration, in pursuance of its undoubted functions, is interfering unduly with the internal arrangements of his command; his relations with the Wing Commander, Flying, may not always be easy, for this officer, while not exercising direct command over the squadrons, is nevertheless responsible for directing their operations and training. Above all, the squadron commander has to inspire his subordinates with a sense of urgency proper to the nature of the unit, and this not for a week or a month but for the whole period of his command. It is an exacting, responsible and enviable job, and vitally important.

The Squadron Commander's task, apart from exercising effective command over his unit, is to train his aircrews. Pilots, navigators, signallers, gunners, all have to be kept at a high level of proficiency in their several jobs. As ever in aviation, proficiency can be maintained only by constant practice. Training in the air is backed by synthetic training on the ground, by lectures and by study. The pattern for all this is defined by a syllabus for each category of aircrew and by examinations. The training, some of which is tedious, can be executed in a routine manner and the charts will still look right; to be effective, however, any idea of routine must be banished and the whole process infused with an air of novelty and a spirit of competition. This is the Squadron Commander's particular problem in peace time; on his ability to solve it will largely depend his claim to that much-debated quality leadership.

It would be an over-simplification to suggest that it is possible to concentrate on the aim without any deviation. There are, in fact, many unavoidable diversions. There is, for instance, the need for the station to play its part in stimulating recruiting. This, of course, is a matter of vital concern to the efficiency of the Air Force as a whole, but is still irrelevant to the pure functions of a fighting unit. It calls for liaison with neighbouring towns and civil organizations; it means parades, guards of honour, open days and flying displays; it entails substantial commitments in the encouragement of local units of the Air Training Corps and the provision of training camps for others. All these things are pleasant enough and it is a great thing for a station to be sustained by the friendship of its neighbours. But such commitments can amount in sum to a formidable diversion.

Is it, in fact, possible, apart from such diversions, for all the varied components which go to make up a Bomber Station to be welded into a fighting machine? The onlooker from outside will find it hard to believe. It is all so sprawling; it cannot be comprehended in a glance as is the case with a warship, for instance. But the machine is there, and it does work; and there are times when, to the initiated, it can be felt to work. The best of these times, perhaps, is that moment, on the night of a large-scale operational exercise, just before the aircraft engines are started. The day has been full of activity. Ground crews have worked fever-

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ishly to achieve maximum serviceability of aircraft; even now last-minute snags are being rectified. Bombs have been hoisted, guns and cameras fitted. Aircrews have been briefed, have tested their aircraft, have rested and are now ready with parachutes, "Mae Wests," dinghies, sextants, torches, maps and thermos flasks. At Air Traffic Control a final check is being made of the aerodrome lighting, the radio, the fire and rescue services; the signals section is working at full stretch. The mechanical transport section is busy, as always; everybody wants transport tonight. The messes, adjusting their routine to reality, have provided early meals and are now preparing for late ones; the cooks, those obscure but vitally important people, will work late hours tonight. The Station Commander, standing perhaps on the balcony of the control tower, feels all this activity because he knows about it. There have been snags during the day and more will arise tonight, some new and some familiar; all must be dealt with tomorrow. But the machine is turning over, the team is going into action, the station is performing its appointed task.

One by one the engines burst into life; the aircraft, picked out by their navigation lights, start to move in procession to the take-off point. The first one turns slowly on to the runway, pauses to clear engines, and then with a roar of propellers in fine pitch, moves steadily down the line of lights. She gathers speed, suddenly her lights rise slightly and she is airborne; the next one starts to move, and so on until all are gone. They will climb towards the east as they did in the war, because ruined Heligoland is used as a practice target on these occasions. Thinking of war, and speaking of it, will not bring war any nearer; in any case, wars are not made by soldiers, sailors or airmen, who know how terrible they will be and how hard to win. But there is the stimulus, if one is needed. The business of a Bomber Station is the first-line defence of Britain and civilization against the next aggressor. Nothing less.

BENEVOLENT FUNDS

THE ROYAL AIR FORCE QUARTERLY contributions to the Benevolent Funds of the Commonwealth Air Forces for the June, 1949, quarter:

	£	s.	d.
The Journal's donation	21	5	0
	£21	5	0

R.A.F. Benevolent Fund	£11	5	0		
R.C.A.F. Benevolent Fund	3	10	0		
R.A.A.F. Benevolent Fund	2	10	0		
R.N.Z.A.F. Benevolent Fund..	2	0	0		
S.A.A.F. Benevolent Fund	2	0	0		
				21	5 0
Brought forward				1,007	5 10
Grand total contributed to date				£1,028	10 10

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THAT NEXT WAR

By J. M. Spaight, C.B., C.B.E.

I.—DEFENCE

THAT next war—to nine people out of ten that means one thing and one thing only: a war between the Atlantic States and the Soviet Union. On land the latter, the aggressor, will have the advantage, and the first task of the defence will be to prevent the Red horde from overrunning all Western Europe. The Western strategists in their plans can hardly fail to take account of the fact that two great rivers, more or less parallel, run north and south in the west and centre of Germany. Are they rivers of destiny? Did Nature place them there so that in full time they should serve to save civilization?

They are the Rhine and the Elbe. Each is a formidable water barrier. The Rhine has a course of over 500 miles from Basle, where it emerges from Switzerland, to its mouth in Holland. It is more than 400 yards wide at Mainz when its flow is lowest, and nearly 400 at Cologne. The Elbe is 725 miles long. It is over 300 yards wide at Dresden and a little more at Magdeburg. Each river is a potential anti-tank ditch cutting the path of the invader from the east.

Western strategy, it is reliably reported, is based on the holding of the line of the Rhine from Switzerland to the North Sea. The Elbe would be an alternative choice, but the probability is that it would be overrun before it could be manned in adequate strength. There would be some breathing space before the Rhine was menaced. What strength would be needed for its defence?

A force of fifty motorized and ten armoured divisions was suggested to be necessary in an agency report from France in January, 1949. Of these, thirty-five motorized and five armoured divisions would be furnished by France. Such a contribution would clearly be beyond France's capacity at present. A more recent estimate of twenty mobile divisions is much more realistic. No more could be found, in all probability, by the European parties to the Atlantic Pact for some time to come.

Later, no doubt, American forces would be added, but their presence could not be counted upon in time to meet the first onset. The Atlantic Pact, in Article 5, preserves the right of Congress to declare war; that is the effect of the Article, though it is so phrased as not to alarm unduly the European parties to the Pact, always apprehensive about a possible delay in the arrival of reinforcements from America. That such assistance will materialize is not to be doubted, but to assume that it will be *at once* forthcoming would be unwarranted. Congress is inclined to be loquacious. The first and pressing need of the situation will be to hold the barrier of the Rhine until the immense strength of the Western hemisphere is available to stiffen the defence.

The strain on the line could be eased if a leaf were taken from the book which records the operations of the Anglo-American armies and air forces in 1944-45. General Eisenhower bore testimony in his report to the vital contribution to the success of his campaign which was made by the great air assault on the enemy's railway network. The destruction of the bridges over the Loire and the Seine was of especial importance.

There are many bridges over the Elbe, from the five at Dresden to the four at Hamburg, where the river is bridged for the last time. If those crossings were made impassable it would be virtually impossible for the Russians to nourish a great attack on the Rhine. It should be within the capacity of the Western air forces to write all these bridges off, as well as any pontoons or makeshift bridges that might replace them.

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What strength in the air would the Allies need? A figure of 450 to 550 squadrons was suggested by Lord Templewood and Lord Trenchard in the House of Lords on 24th November, 1948, and 23rd March, 1949. Five hundred squadrons would yield about 9,000 first-line aircraft. It was suggested that the United States should provide two-thirds of this force and that the British share should be one-third, but presumably there would be contributions also from France and the other allies. The United States is building up an air force of seventy groups, with a number of special squadrons in addition; behind it stand the National Guard and the Reserve. The result should be a first-line strength of 4,000 to 5,000 aircraft. The Royal Air Force programme has not been disclosed, but an intelligent guess would put it at 2,000 first-line aircraft; that would be less than a quarter of our strength in 1945. A further 2,000 ought to be within the capacity of Canada, France, Belgium, Holland and Norway in combination.

The bombers of such a force would be sufficient in numbers to deal with all the Elbe bridges if they concentrated on the work, even if there were some delay in the arrival of the Americans. They would have radar stations to help them in France and the Low Countries and would be able to use the G.H. system which proved so effective in the last stages of the late war. The effect of the destruction of the bridges upon the Red armies' mobility should be disastrous. Their morale would be affected, too, by the thought of these broken bridges behind them.

What of the Red Air Force? Will it not hop over the rivers and land thousands of men on the western side? Judging by the poor showing which the Soviet parachute service, much boosted before the war, made against the Finns in 1939-40 and the Germans later, one is not inclined to take the tall talk about the proficiency of this arm at its face value. It is true that the Red Air Force is large; possibly it has a first-line strength of 12,000 to 14,000 aircraft; but, unless a miracle has happened, its performance will be inferior to that of the Western air forces. Its radar technique and equipment will probably be below standard and its interceptors are unlikely to be able to waylay the West's night bombers.

II.—OFFENCE

The policy of holding the Rhine and scorching the Elbe, if successful, will save Western Europe from invasion. It will not drive the Soviet armies out of Germany. How will that further task be accomplished? It can only be done, some people think, in the traditional way. The Western Powers—the United States will then be fully mobilized—will have to take the offensive on land and push the Russians back. They will have to carry the Pact on their bayonets. Such is the argument of F. O. Mischke and E. Combaux in their book *War Between Continents*, 1948. They envisage a war in which a Russian tide will sweep westward to the Atlantic seaboard and will recede only when another wave of assault from the west forces it back by degrees to the east. They consider that the first task of the Western strategists must be to recapture all the key positions lost to the enemy. The counter-attack would be launched not from the west only; it would strike from the south at the Caucasus, to capture the oil wells there, "the loss of which would call a halt to the Russian war machine."

Note those last words: are they not an admission of the possibility which Messrs. Mischke and Combaux never face squarely, that there may be another and better way of defeating Russia than pushing her back in a series of great land battles to where she belongs? They foresee a war of the traditional pattern, a Russian advance followed by a Russian retreat, an invasion from the east succeeded by an invasion from the west. But if the oil plants of the Caucasus are so vitally important that the loss of them would immobilize Russia's war machine,

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what need have the Western Powers for a great *land* offensive? A great *air* offensive would give the same result; the oil plants would not have to be captured to be put out of action. A strong land *defence* of the west—yes, that is necessary; we do not want the Russians sitting just across the Channel and in a position to pelt London with guided missiles at comparatively short range. But the counter-offensive by land—surely that can be dispensed with if we and the Americans bring into play the tremendous instrument of air power which we seem certain to have at our command.

That, at any rate, seems to be the moral of a striking paper by two American writers which appeared, in translation, in *Forces Aériennes Françaises* for January, 1949. The picture which these writers, Joseph and Stewart Alsop, present in their article—the title of it is "If War Comes"—is that of vast Soviet armies trudging painfully across Europe while powerful air missions strike at Russian targets two or three thousand miles from their bases and destroy all the nerve centres of Russian war strength with atomic bombs. (More will be said in a moment about atomic bombing.) Soviety economy, they point out, is of a distinctly primitive character; that is its weakness. The profitable targets are dispersed in space, but they are not numerous. If twenty Russian towns were to suffer the fate of Hiroshima the Kremlin would lose:

99 per cent. of its aeronautical production;
60 per cent. of its steel production;
65 per cent. of its petrol production;

as well as many other essential commodities. In the industrial group comprising Moscow, Gorki, Tula, Kagan and Yaroslaval, 75 per cent. of all the automobile industry is concentrated. More than 50 per cent. of all Russian aeronautical production comes from five towns in the Volga area, Saratov, Koubychev, Astrakhan, Ulyanovsk and Ufa. About 50 per cent. of Russian oil production is centred in the Baku region. Much more than 50 per cent. of armoured-car production is centralized in the Ural group formed by Sverdlovsk, Magnitogorsk, Chelyabinsk, Chkalov and Uralsk.

The loss of objectives of primary importance in eighty towns alone, they contend, would mean in effect the reduction of the Soviet Union to the condition of a desert, without industrial production or means of transport. It would immobilize the Red Army, which would then become an easy victim for even numerically inferior enemy forces. It could be inflicted by a task force of 300 to 500 American aircraft, they suggest, provided that the necessary bases were available.

Where would the bases be? The writers of the article set forth a list of these, ranging from Ireland to the trucial coast of Arabia and beyond it to the Far East. From Western Europe it would be possible to attack Moscow, the industrial valleys of the Don and the Dneiper, and the nearer towns of the Urals—Sverdlovsk, Chelyabinsk and Magnitogorsk. All Central Russia and the Ural and Batu regions could be reached from the North African littoral between Tripoli and Suez. The Arab kingdoms and protectorates would furnish a starting point for attacks on the new Siberian centres—Novosibirsk, Stalinsk, Krasnoyarsk and Komorovo, and, again, the Baku and Ural regions. From Japan and Okinawa the towns of the Amur River and Vladivostok could be reached. There would be no lack of bases from which damaging attacks could be launched against the nerve centres of Russia's war economy. Such is the shape of the war between continents which these writers foresee.

They assume, it will be seen, that the attack will be made with atomic bombs. Possibly it will. Only one country is at present in a position to use the new weapon —the United States. Will she, in fact, use it? That is the question. There was in

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that country, we know, a widespread and deep-felt searching of hearts after the destruction of Hiroshima and Nagasaki. Will American consciences approve the writing of another chapter of the tragic story that began in August, 1945? They may be steeled to do so by the remembrance that Russia, and Russia alone, blocked the proposal for the banning of the new projectile and the organization of a system of international inspection designed to make the ban effective. On the head of Russia, it could be argued, would rest the responsibility if her cities suffered the appalling fate which it was within her power to avert.

Their fate would be a swifter one, at least, than that which would be the lot of every free people over whom the Red fury swept. What would our lot be here, in Britain? It would be far worse, the apologists for atomic bombing could urge, than anything we should have had to endure if Germany had won in 1914-18 or 1939-45. Our foe was not a semi-Asiatic power then. Defeat for us might mean, they could say, if Bolshevism ran true to form, the pitiless slaughter of our Royal Family, children and all, the massacre of our officer class (as at Katyn), the liquidation of all public men except the Communists and their fellow-travellers, the slower but not less brutal murder of millions of political prisoners, trade unionists among them, in concentration camps, the suppression of "leave to live by no man's leave, underneath the law," the enthronement of the gang with the arms. Would not the use of the atomic bomb be lawful, it could be asked, to save us from such a fate? The answer which eminent British Churchmen would give would, it seems, be "Yes." Dr. E. G. Selwyn, Dean of Winchester, and his fellow-signatories (including Professor H. A. Smith, the international lawyer) of the report called for by the Archbishops of Canterbury and York upon this subject, did not shrink from the view that the necessity of self-preservation might justify the use of even the atomic weapon against an unscrupulous aggressor (*The Church and the Atom*, 1948, p. 111). If, as Mr. Churchill has stated, the bomb alone stands between us and a Russian domination of the world, there would be few to challenge its use in a life-or-death struggle against Russian aggression. The situation, it could be argued, would be an altogether exceptional one; it would not involve abandonment of the view (which the present writer shares) that atomic warfare should in general be outlawed.

The atomic bombs would have to be duly delivered to their destination. How would the bombers carrying them fare against the Red fighters? The latter are reputed to be the strongest arm of the Soviet Air Force, the bomber arm of which is much less efficient. The Russian jet fighters would be operating at home and their relatively restricted range would for that reason not be a handicap. The answer to this problem proposed by the American planners is one which depends, it seems, on the time factor, that is, on the date at which the "next war" is likely to come. The United States may by that time have in service a sufficient number of jet bombers for the long-distance operations that will be involved. Alternatively, if the war comes within a couple of years, it would be necessary to rely on piston-engined bombers of the B-29, B-36 and B-50 types.

The American jet bombers are likely to have a speed of something more than 500 miles per hour and a range of over 2,000 miles. The Russian interceptors will be faster, probably, by 100 miles per hour. For their protection, it seems, the bombers will be escorted by long-range fighters such as the Curtis XF-87, "Blackhawk," which has a range of 2,400 miles and is as large as a medium bomber. If, on the other hand, bombers with piston engines have to be used, the intention is apparently to give them the protection of "parasite" jet fighters such as the tiny McDonnell XF-85 which has folding wings and can be carried inside a B-36 bomber, to be released when enemy fighters are encountered.

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The range of the piston-engined bombers is considerably greater than that of the jet bombers. The Convair B-36, referred to above, has a range of 10,000 miles with a 10,000-lb. bomb load; it has six engines. The B-50 has four engines and its range with a similar load is 5,800 miles, but is better able to protect itself than the B-36. The B-29's range is about 1,000 miles less than the B-50's, with the same load, but is still substantially greater than that of any jet bomber.

It is not unlikely that the air offensive will be promoted to the place which some leaders, and not airmen only, thought that it should have been given in that war. One of the most striking disclosures in General Eisenhower's *Crusade in Europe* (p. 185) is his record of a private conversation with General Sir Alan Brooke, Chief of the Imperial General Staff, in May, 1943. General Brooke, he says, "favoured a policy of applying our naval and air strength toward the blockading of Germany and the destruction of its industry but avoiding great land battles on the main fronts. He held the belief that in ground conflict in a land theatre we should be at a great disadvantage and would suffer tremendous and useless losses. He wanted to open no larger front than one we could maintain in Italy."

Lord Alanbrooke's argument could be applied with still greater force to the situation which is likely to present itself in the next war, if and when it comes. In a game of hard slogging on land the Russians will always have the advantage in the shape of their vast reserve of man power. "Killing Bolshies" will be a slower business, and a more costly one in casualties to us and our allies, than "killing Boches" was in the First World War. The blood-baths of the Somme and Passchendaele may be repeated on a still more terrible scale. To win the war in the alternative way that is possible, by destroying the sources of Russia's armed strength, is surely preferable to reverting to the method of mass slaughter. The best way of all will be the destruction of the enemy's power of movement.

His nerves of motion can be paralysed from the air. That was one of the most striking lessons of the Second World War. It was the grand assault of the Anglo-American air forces on Germany's railways and oil plants during the last year of the war that more than anything else made effective resistance to the invasion of the Reich impossible. Russia, Lord Templewood pointed out in the House of Lords on 24th November, 1948, is particularly vulnerable at two points—her communications and her oil supplies. Her capacity for offence would be broken if powerful Allied air forces battered her relentlessly at these two points in her armour. They would be still more profitable objectives than her industrial cities; the products of the latter would be useless if they could not be moved to the front. Attacks on transportation and oil yield quicker results, if the bomber offensive against Germany is a true guide, than attacks on urban targets.

Hold a line on the ground, then, from behind that line, launch the counter-offensive by air: that, it is submitted, is the pattern the next war should follow. The air offensive, to be massive and overwhelming, will call for big bombers to smash it home. They, and they alone, will be able to do what has to be done. They can do it. They can break the Red menace. The American, British and French air forces, with the fighter groups which will be furnished, according to reported plans, by the Belgian and Dutch air forces, would represent an array of air strength surpassing anything which the Slav States could muster. Air power will be the West's strong hand. Let the West play it, for all it is worth. Do not let us be deceived by tales of push-button warfare, of guided missiles, of aerial robots to which the V1's and V2's of the last war were but as children's toys. The day of the manned bomber is not past. Let us not be in too great a hurry to write it off as a back-number. Its most important work may still remain to be done.

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THE INFLUENCE OF AIR FORCES ON SEA POWER

By Squadron Leader A. McI. Peacock

"We must not exaggerate this new factor—I find myself almost resenting the exaggeration of this new factor—but neither must we refuse to give it its deadly due."

Winston Churchill (*after Norway*)

So much heated and even acrimonious discussion has taken place on the influence of aircraft on sea power that, in any review, it is essential to be quite clear as to the meaning of the terms used.

Sea power as defined by Mahan and Corbett is, very briefly, the power or ability to use the sea for the movement of your own forces, supplies and trade and to deny that usage to the enemy. Its outward symbols are not only the navies of the world but also the merchant ships, liners, coasters and the port and shipyard facilities behind them. The navies are, or were, the weapons by which those ships were protected from enemy interference and by which the enemy was denied the privilege of unrestricted ocean movement. Navies, or fleet strength, constituted one part of the means by which sea power was exercised and the merchant fleet the other. Fleet strength has never, by itself, been the sole measure of sea power. It is largely by reason of the failure to differentiate these two elements that much of the confusion on sea power arises.

The sea cannot be occupied by ships as armies occupy land. Command of it may be constantly in dispute and need not be held by either adversary. This is as true for maritime warfare in this air age as for the old surface struggle.

As the only weapon that could influence sea communications and trade, the Navy became a vital need to Britain as a maritime nation. The aircraft brought a new and, for a time, suspected factor into maritime warfare. Its value was discounted for some time by the Navy, but its uses and prime importance have been proved in the testing ground of war, until now the R.A.F. and air power have displaced fleet strength as Britain's first line of defence. The First World War was fought while aviation was in its cradle and it is necessary to look to the Second World War to see the true portents of the influence of air forces on sea power.

SPECIAL FEATURES OF AIR FORCES ENGAGED ON MARITIME OPERATIONS

The aircraft, which came on to the stage of maritime warfare with numerous and serious disadvantages, has now overcome the majority of them. Its superiority in speed over naval vessels and the ability of the small to take on the large have existed for some time. Its inability to remain on patrol for any length of time is compensated by the comparative ease with which successive patrols can be arranged. Its range, the speed with which reconnaissance intelligence can be brought back and its ability to see into harbours and, by photography, record enemy dispositions in perfect detail are invaluable. The aircraft can now carry a missile with ten times more explosive than is ever likely to be fired from a naval gun. Technical progress steadily extends these advantages.

The drawback that the aircraft is not an all-weather, twenty-four-hour weapon

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is steadily being surmounted. Radar enables it to see and attack by night; training and navigational aids are extending the ability of aircraft, both carrier- and land-based, to operate during any weather.

Aircraft provide maritime forces with a strategic advantage not previously enjoyed. Enemy bases could not safely be by-passed without the long and costly process of blockade or land assault; now they can be neutralized by air attack. Island bases are particularly vulnerable to this strategy in that, after the first direct attacks, blockade by air can keep them ineffective. This new ability to ignore enemy bases was ably demonstrated in the American island-hopping campaign in the Pacific. The Japanese bases of Truk, Rabaul and Ponape were by-passed and their value as advanced bases converted into liabilities as virtual internment camps. The situation even arose in which by-passed island bases were used as practice targets. In the Mediterranean, Malta constituted a similar threat to the enemy's communications to North Africa, but could never be ignored because it was never neutralized.

While torpedo and anti-submarine operations are specialized forms of aircraft employment, the inherent flexibility of aircraft still applies to sea warfare. Squadrons were transferred during the war from Bomber to Coastal Command, long-range fighters can undertake strike-escort roles and bombers can be employed on minelaying or attacking submarine pens and shipbuilding yards. This was instanced in the raid on the submarine Diesel-engine factory at Ausberg and the bomber attack on Vegesack. Strategical flexibility is a quality also enjoyed by ground personnel: they form by far the larger part of any air force and can quickly be transferred to maritime squadrons from any other duty. This contrasts sharply with the time necessary to exchange army and navy personnel in equivalent trades. The invaluable birthright of flexibility must not be thrown away by over-specialization in aircraft design or aircrew duties to the point that they cannot be used other than in one limited role.

Air forces have the peculiarity that they can be taken to, and operate from, the sea. While limitations are imposed on the size of aircraft, this gives them an increased advantage of mobility; they can be concentrated at any desired spot on the ocean. With these qualifications carrier-borne aircraft are not different in use, nature or potential from any other aircraft, and the use of the term "naval air" in an attempt to create a difference where none exists must be deplored. It is pointless to distinguish between aircraft employed against ships and those used for interception, bombing or transport, and so to say that the former are an instrument of naval power, or, by using mines and torpedoes, are an arm of the Navy, and the latter of air power. They are all uses to which the immensely flexible weapon—the aircraft—can be put.

The use of carrier-borne aircraft in a prolonged intensive effort does appear to be attended by a particular danger: as fatigue and strain on pilots increase with continuous sorties so accuracy falls off and a tendency to over-estimate success grows. This danger was dramatically illustrated in the battle off Samar: six air strikes against the main Japanese fleet in the Sibuyan Sea had reported damage sufficient to render it ineffective when it was largely unharmed and, as a result, caught a fleet of U.S. light escort carriers at close range.

THE USE OF AIRCRAFT IN SEA BATTLES

The ability of aircraft to bring hostile naval forces to battle with their own surface forces was well demonstrated at Matapan and by the *Bismarck* incident. They have, however, shown that they can play the primary role in naval battles. In 1940, by all accepted rules, Germany made a strategical error in launching an

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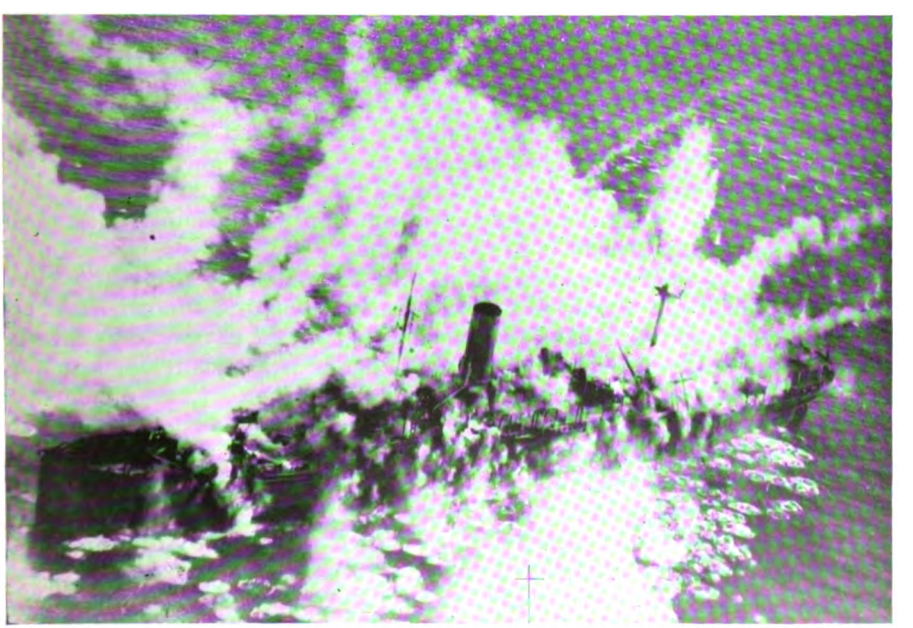
invasion of Norway across the sea without command of that sea. When our naval forces attempted to carry out their traditional role aircraft drove them back and provided a protective shield under which enemy surface vessels moved at liberty. Air forces had challenged fleet strength in exercising sea power and were victorious. Crete and the sinking of the *Prince of Wales* and *Repulse* followed the same pattern—enemy naval forces played no part in the decisive phase—the stage was different, but the actors and roles were always the same. The new figure that had marched so dramatically on to the stage of maritime warfare at Norway proved that he had come to stay.

Norway was out of range of our fighters, at Crete they were withdrawn; yet each time the British naval forces were forced to retire after suffering severely. The British naval forces at Crete could not prevent the invasion and the losses sustained from air attacks disturbed the supremacy it held in other waters. Naval supremacy was forced to acknowledge its impotence against command of the air: surface vessels could not operate within range of enemy air superiority.

Both we and the Americans had assumed that naval battles would be fought in the old traditional style, but, apart from night actions and an accidental battle of Samar in the Philippines, no major purely naval engagement took place. The vital battles of the Coral Sea and Midway and the important battles of the Eastern Solomons and Santa Cruz Island were fought by aircraft launched from opposing fleets which did not sight one another and the casualties suffered by the carriers decided the issue. In retrospect, this fact is not surprising: any commander tries to get in the first telling blow and fleets come within the range of aircraft before that of any other weapon. This pattern, so closely followed in the Pacific, is likely to be that of all future naval actions fought outside the range of effective interference of land-based air forces.



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A German victim of our air power

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In the Battle of the Philippine Sea (June, 1944), brought on by the continuous progress of American forces towards the Japanese homeland, Japanese aircraft suffered such losses that, with their carriers ineffective, the Japanese withdrew still not having seen the opposing fleet. During that withdrawal their position was discovered and again carrier aircraft inflicted heavy casualties.

An important lesson is to be learned from the Pacific of the strategic effect of air superiority in maritime operations. When the balance of carrier strength turned at Midway in favour of America, Japan was forced to the strategic naval defensive. As she was not permitted to regain carrier superiority she was never able to turn from the defensive, but slid steadily down from the zenith of her success to defeat. Aircraft, not fleet strength, decided an ocean campaign. Where air forces have obtained local or total air superiority over the sea, the opposing surface forces will be forced on to local or total defensive strategy determined, in extent, entirely by the measure of their opponents' air superiority over that sea.

THE USE OF AIRCRAFT AGAINST AND IN DEFENCE OF SHIPPING

In the summer of 1940, as part of the plan for invading Britain, the Luftwaffe virtually stopped our Channel traffic by air attacks on ports and shipping. In the Mediterranean the enemy made determined attempts by aircraft to stop shipping going to Malta. In February, 1942, only one ship out of a supply convoy escaped destruction, in March a convoy was sunk in harbour before it was unloaded, while in June, out of two large convoys sailing simultaneously, one was forced, mainly by air action, to turn back and, of the other, only two ships reached Malta.

We were not in possession of the Cyrenaican or North African coast line and could offer no air protection to the Malta convoys. Yet, as soon as a land advance permitted air operations from bases affording cover to the route, a convoy reached Malta without loss. While the enemy held the air bases around the Central Mediterranean it became an Axis lake through which we could not pass a convoy.

In the Bismarck Sea, in 1942, a Japanese convoy was found and entirely destroyed by land-based planes. This success was repeated near Ormoc in 1944. In battles within range of land-based aircraft they showed a superiority over carrier-borne air forces, and air superiority in those areas was gained by the combatant that occupied the airfields covering the sea areas concerned.

The effectiveness of aircraft against merchant ships is so complete that, provided all the waters around it are within range, an island or base can be blockaded by air alone irrespective of relative fleet strengths. It is of no value to a combatant if not a man or spar of his fleet strength is injured while his cargoes and transports are sunk. The principle that surface navies cannot remain in waters in face of even local air superiority has proved equally applicable to merchant ships.

The value of aircraft against submarines was long in question. In fact, up to the spring of 1943 aircraft accounted for only 25 per cent. of the total casualties inflicted on German submarines. In the last two years of the war they so far outstripped surface craft in effectiveness that, by 1945, land- and carrier-based aircraft had accounted for nearly 60 per cent. of the total destroyed at sea. Frequently the presence of an escorting aircraft resulted in a convoy escaping any loss. Statistics may often be misleading, but these show, beyond possibility of challenge, that the aircraft was the decisive weapon against submarines and so it should be in the future.

It is true that submarine developments in the last few months of the war,

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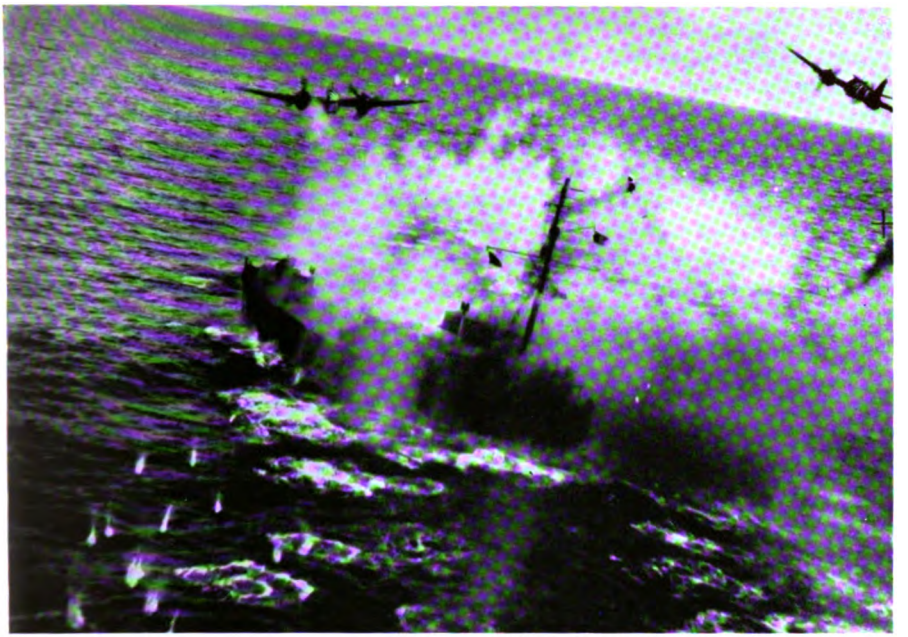

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Beaufighters attacking a heavily armed German ship in the Heligoland Bight. Low-level attack

particularly that of schnorkel and the progress towards design of the true submarine, are, to us, causes for great concern. They have, at present, reduced the effectiveness of aircraft operating against them. But we should remember that science alternates between favouring first the attack and then the defence. If we realize the vital importance of mastering these submarine developments and of research in countering them, an answer should not be beyond our inventive capacity. The tactical advantages of aircraft working against submarines, independently or in co-operation with the escort vessels, are so great that research should be directed towards restoring the eyes to the aircraft, so that schnorkelling and even true submarines can be located and attacked from the air.

The success of the island campaign in the Pacific enabled the U.S. to impose an aerial blockade on all Japanese shipping to Formosa, the Dutch East Indies and the South China Seas. The aerial mining of the Japanese shipping routes around her homeland in 1945 had, by that August, completely stopped all raw material shipments to Japan and reduced cargoes of food to a small fraction of earlier tonnages. When it is realized that 90 per cent. of oil and 88 per cent. of iron and over 20 per cent. of food consumed were imported, the magnitude of the disaster to Japan may be gauged. From January, 1945, onwards, when aircraft were within range of the Japanese mainland, aircraft accounted for more than double the number of ships sunk by submarine. The sea blockade and attrition of the Japanese merchant fleet from a peak of ten million to less than one million tons were themselves sufficient to have ensured the defeat of Japan.

Late in 1944 and early 1945, when Germany wished to assist her hard-pressed Western Front with divisions from Norway, special shipping was collected to withdraw two to three divisions a month. By March, 1945, owing to air attacks

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and air mining, the flow was only one division in six weeks and by April the movement was negligible. This was a painful reminder of the influence of air forces in exercising sea power she had first demonstrated to us in those same waters in 1940.

Aircraft can lay mines with great accuracy, existing minefields can be flown over and fields suspected of having been swept can be refreshed. It is impracticable if not impossible to mine rivers, canals and defended harbours by any means other than aircraft. Some 73,000 mines were laid by the R.A.F. in offensive minefields and some 600 German ships were sunk by them. Mines laid have a second and sometimes as important effect as shipping actually destroyed: all movement in a harbour or canal may be brought to a standstill by the existence of unswept mines. For the first time air forces can stop and hold an enemy.

THE USE OF AIRCRAFT AGAINST PORTS

The ability of aircraft to step over land defences to attack their targets is again illustrated in attacks on ports. The mere threat of attack on the Port of London was sufficient to cause the larger part of its shipping to be diverted. When the attacks did come, dock facilities and warehouses showed themselves particularly susceptible to attack, and ships sunk in harbour became serious obstructions to port operations. The attacks on the Piræus and Bari revealed, if it was necessary, the vulnerability of military ports with their bulk, dangerous cargoes. These raids and those on Darwin, Hamburg and Rabaul, proved that, while it was extremely difficult to put ports out of action for a long time, successful raids can be made even against local fighter superiority. This danger is materially increased with the use of atomic weapons.

The raids on Taranto and Pearl Harbour demonstrated, in a classic manner, how a fleet at anchor can be attacked. The fact that they were made by naval planes is immaterial—aircraft alone made them possible.

Important lessons are to be drawn from Malta. This critical port, the only British naval base in the Central Mediterranean, was evacuated by the fleet under threat of air attack and, in fact, major fleet units were not again based there while the threat remained. A fleet can no longer find safety in port within range of strong enemy air forces. A weaker fleet, declining action by retiring into harbours behind fortress artillery in order to maintain the threat of a "fleet in being," is itself under threat of air attack. The island, which was virtually abandoned as a naval base, arose, phœnix-like, as an air base. It became manifest that naval bases are more difficult to operate than air bases under the same intensity of air attack, and Richmond's contention that

> "Nothing is less probable than that attacks on vessels in harbours and their establishments . . . will be so successful as to sink or drive away all the fighting vessels, and that the dispute for the use of sea communications will rest wholly with those that navigate in the air"

has been totally disproved in the acid test of war.

THE USE OF AIRCRAFT WITH SEABORNE ASSAULT

It is a duty of sea power to land an army safely, and to maintain it, on any shore decided upon by national policy. The use of aircraft in support of such action is now considered essential and, if the land being attacked is outside close land support, the air effort must be supplied by carrier forces.

This was the method adopted by America in the Pacific campaign. Surface task forces were built around one or more carriers and directed against each successive

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island target. Aircraft took off, usually at extreme range, and took as their targets the enemy air forces on the islands around and on the target and then gave close support to the land battle. The bombs, rockets and guns carried by aircraft established their ability to soften-up islands and beaches. Hollandia and Biak were taken after such attacks with negligible losses. These operations, and Midway, showed that aircraft were essential in protecting waterborne invasions or in turning back such a fleet. Air forces proclaimed that they could not merely undertake a task carried out previously by fleet strength but that they could do it better.

The carrier is the vital unit of a task force—all other surface vessels are subsidiary. It must be used when operations are outside the range of land-based aircraft, although that area, and the need for carriers, will steadily diminish as the speed and range of land-based aircraft increase. Within their range the use of land-based aircraft is preferable to the use of carrier aircraft. Land aircraft should, in an island campaign or in narrow seas, take over the duty of maintaining air superiority at the earliest possible moment.

The carrier suffers from a serious disadvantage—its size, thin armour and the enormous area of its flight deck place it in considerable danger, particularly from air attack. Ten out of the fifteen Japanese carriers lost fell victims to aircraft. As, over land, the bomber will always get through, so at sea: defending fighters can never guarantee that hostile strikes will not reach the carriers they are defending. On a number of occasions in the Pacific strike aircraft returned from missions only to find their own carriers sunk or unusable. The danger can be lessened in some measure by using light carriers and escort carriers, which, in effect, provide dispersal and can be built more quickly than fleet carriers.

The aircraft has shown itself more effective as an offensive weapon against surface vessels than in a defensive role protecting them. The susceptibility of carriers to attack must, however, be accepted; their armour cannot be materially increased, although A.A. defence steadily grows. The tremendous power wielded by aircraft in maritime operations is sufficient to accept this drawback in carriers and still prove that they are the dominant factor in sea warfare outside the range of land-based aircraft.

As so frequently happens with surprise weapons and tactics, their effect is overrated until they are understood. So the airborne invasion of Crete seemed, at first, to indicate that seaborne invasions were a thing of the past. Air Marshal Sir H. Lloyd has, however, stated that without the help of land forces brought across the sea, the German airborne troops would have had little hope of victory. Examination of the facts reveals that Crete could have been taken without the prodigious expenditure of man power and aircraft that was outpoured. Airborne and parachute troops were thrown in at the same time that enemy air forces commenced operations to secure command of the surrounding seas—seas which were already dominated by air bases in their hands. The British naval forces were soon driven off and enemy surface transports then reinforced Crete at will. Crete could, in fact, have been invaded by a normal air-supported sea landing as soon as air superiority had driven the opposing naval forces from the surrounding seas. An aerial blockade of Crete denied the island all but a trickle of British supplies and so ensured that resistance would not be prolonged.

It is doubtful whether aircraft will ever be used to transport the tremendous weight of stores that invading armies now find necessary. Their capacities do not permit this function being taken over from merchantmen. Their true role in transport is effecting surprise, jumping over enemy defences, reinforcing a hard-pressed point or disrupting the enemy's rear, but not carrying the main weight of an invasion.

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THE EFFECTS OF AIR POWER ON SEA EVACUATIONS

No operation in maritime warfare is as difficult as an evacuation, particularly when carried out in the face of hostile air forces. Our own evacuation from Dunkirk was made possible not by the Navy but by R.A.F. home-based fighters which gained local air superiority. Motley flotillas of small craft and vessels took off 75 per cent. of the personnel evacuated and the Navy assisted them not as fighting ships but as improved ferries—as were all the other evacuation ships.

At first sight the evacuation from Greece runs counter to the principles of the ascendancy of air forces over surface forces. On examination, however, an important fact emerges—the evacuations were made mainly by night, a period during which the Luftwaffe was strangely inactive, and the ships were out of sight of land and afforded some measure of air protection by day. In the following withdrawal from Crete embarkations made at night from the south coast near friendly aircraft were surprisingly successful; those made from the north coast in the face of hostile air forces were severely handled.

The enemy tried one evacuation, from Tunisia, and that against air supremacy. That supremacy did not permit his evacuation by sea or air and the whole of the Axis forces in North Africa fell into our hands. Air forces had again denied the sea to that combatant without air superiority while securing it to him that had. And so it always must.

THE EFFECT OF AIR FORCES ON THE COMPOSITION OF SURFACE FLEETS

The clearest thinking is essential in assessing the influence of air forces on the constitution of surface fleets. It must discard all crumbling conventions, whether or no they have been clothed with a mantle of tradition.

The battleship was the first ship whose retention was challenged by aircraft and, being the backbone of all fleet strength, the challenge has been resisted fiercely. The battleship's primary purpose was to accept battle from the heaviest and most powerful enemy ships. Now, the most potent weapon against surface ships is the aircraft—of ten Japanese battleships sunk by U.S. forces, five and a half were credited to aircraft. The battleship's armour may keep out missiles, but the ship's structure cannot stand the explosive forces of heavy bombs. It cannot support its light forces against air superiority and the power that enjoys air superiority does not require its assistance. It is not permitted to get near enough to opposing fleets to use its weight. It requires aircraft to protect it and, like the war-elephant and knight in armour, is fated to disappear.

Bombardment of enemy coasts can be carried out by monitors, cruisers, rocket ships or aircraft, and, as soon as the aircraft becomes an all-weather, twenty-four-hour weapon and can defend the task force against surface attack, the battleship will relinquish its last usefulness.

The need for cruisers as the eyes of the fleet and for commerce protection falls away as these duties are assumed by aircraft. The days of the large 10,000-ton cruiser may well be counted with those of the battleship.

CONCLUSIONS

Sea warfare is even more dominated by air forces than is land warfare. It has become axiomatic that the air war must first be won over the sea before ships can operate on that sea. With fleet strength and the merchantman both compelled to acknowledge the mastery of air forces in offence and defence, the need for fleet strength depending on gun power dissolves. Navies cannot operate without air

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protection and, if permitted to operate, their duties can more effectively be carried out by aircraft.

Enemies and potential enemies should never be underrated and we should assume that they are as capable as we are of reading the signs of the last war. This, and what we know of our only likely enemy's aircraft and naval-building policy, make it certain that his maritime offensive—for he cannot fail to have seen how vulnerable our merchant economy is—will be waged as determinedly as ever Germany waged it. A wise adversary will give us no time in which to perfect our defences. More than ever before we must review most carefully the allocation of our defensive effort and financial resources between the Services. Protection of our sea communications is absolutely vital and we must put our energies into those weapons on which we can rely and not into those which, while valuable in the past, belong to the past.

Control of the sea and the security of our sea lanes must be broken away from the misconception that a large navy is the essential and primary weapon to protect them. In the days when there were only sea and land forces there was no alternative; today there is. The whole purpose of command of the sea is to pass friendly cargoes and forces over them and to deny such passage to the enemy and not to sail warships to and fro. An ocean of warships while our mercantile trade and sea communications were cut would be valueless to us.

The continent of Europe cannot be moved away from our doorstep. Our trade routes converge in the sea areas around land-mass extremities and consequently around potential air bases. Our convoys and surface fleets will always be threatened by air forces from the European mainland and only our own air forces can protect them.

Sea power, by its very nature, is not challenged by air forces. It is the method of securing and exercising that power that has now changed, for the aircraft has established itself as a more effective weapon than the warship in the protecting and offensive roles of exercising sea power. With our strong naval traditions it has taken a world war to convince us of these fundamental truths, but, as a nation dependent for our very existence on our maritime commerce, we should be well advised to apply the principles of lessons so hardly learned.

[NOTE.—*It is realized that this article is somewhat contentious. The author does not advocate the total abolition of the Royal Navy, but suggests that if more national effort were put into air power it could, if necessary, be effected by some reductions in the Senior Service.*—ED.]

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THE WOMEN'S ROYAL AIR FORCE

"A woman's place . . . . "

By Squadron Officer B. G. Martin

THE Minister of Defence, in moving the second reading of the Army and Air Force Women's Services Bill early in 1948, said: "Only by continuous service and experience can the full value of women as members of the Armed Forces in peace or war be realized."

The obvious arguments to be considered are twofold: what is the best method of realizing the full value of women, and how can women make the greatest contribution to the success of the whole?

The actual field of employment of women in the Service has already already been crystallized after the war-time years of experiment and development, and the rules and regulations, administrative and disciplinary, laid down, and to a large extent proved workable, in these years of evolution.

Women have proved their ability to do the job in an emergency and to stick to that job in the difficult years of transition following the emergency. They have now to prove an equal ability and staying power in peace time.

The problem is partly one of orientation of ideas. The W.A.A.F. worked on an auxiliary basis and W.A.A.F. problems were in many cases dealt with as things apart from the R.A.F. In future, except for "matters affecting their welfare as women," all difficulties arising from the employment of women in the R.A.F. should be treated in their proper perspective, not as separate issues but as matters affecting the Service as a whole. The women will now enlist in the R.A.F. and accept R.A.F. obligations—their discipline will be practically in line with that of the men; posting, remustering and general administration dealt with through the same channels. The woman must now be regarded—and will wish to be regarded—as an *airwoman* and not as a member of a race apart.

So we can say that the airwoman should be treated broadly on an equal footing with an airman and can take her place side by side with him as a tradeswoman with an equal chance of earning promotion.

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The Secretary of State for Air discussing W.R.A.F. and R.A.F. teamwork in B.A.F.O.

The difference in treatment which will form the subject of special study by all W.R.A.F. officers lies in the different outlook on life owing to the more sheltered background of the woman. The young airwoman recruit has in most cases led a far more sheltered life than her brother and has not been used to being completely independent. Therefore a more careful or motherly eye has to be kept on the recruit until she has found her own feet.

But the assumption that few airwomen can take care of themselves

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W.R.A.F. keeping fit

without the constant care of a mother superior and several miles of barbed wire is a wrong one. In any but extreme cases, normal Service discipline is completely adequate to cope, and it is over these extreme cases that the W.R.A.F. officer's advice on the interpretation of the code of discipline will be of most value, and will help to build up experience of its application to women.

There is, sometimes, a disinclination on the part of some male officers to award serious punishment to a woman offender, and one has heard much talk against the award of detention to women. What is so often forgotten is that the woman civil offender is sent to prison, fined or put on probation; in fact, punished according to her offence. It should follow that a W.R.A.F. offender should be awarded punishment according to her offence against the Service of which she is now a regular member. It is the W.R.A.F. officer, the expert on women, who must study her Air Force Law—not from the viewpoint of "that applies to airmen only" but the effect of the whole on *airwomen*, section by section. Women (collectively) are supposed to be more conscientious than men (collectively). Be that as it may, they are certainly more affected by punishment, and the workings of the new disciplinary code for airwomen should present some interesting cases—but it will, I am sure, present far fewer serious problems than might at first be visualized and will equally do away with many anomalies of the past—notably the airman and airwoman partners in crime who received totally different sentences.

Great care has been taken in the past to inspect working and living conditions for airwomen—and there should be no less care in the future. The airwoman is perhaps more easily depressed by cold or gloomy offices, workshops or barracks, because her instinct is to make her surroundings comfortable and home-like. But this is not, and should never be, a purely female problem. It affects the Service as a whole, and the woman's advice should be valuable in its effect on airmen as well as on airwomen.

Equally the woman's experience in catering and cooking and her love of variety could well be used in many mixed messes.

Much experience in administration and discipline has been gained during the past ten years, and every development has emphasized integration and equality of treatment. It is becoming increasingly clear that the full value of women can be realized only by treating them as equal members of the Armed Forces and by making only the essential modifications in Service rules and regulations.

By building up a regular women's Service with long-term engagements, time will be given to study the problem of their greatest contribution to the success of the whole. But even now it is clear that their maximum contribution can be made only by means of a highly trained nucleus of regular, long-service officers, N.C.Os. and airwomen, trained to accept Service discipline and traditions, and to be accepted themselves as an integral part of the Royal Air Force which they serve.

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A large part of the responsibility for ensuring that the women do in fact play their maximum part in the peace-time Service will rest on the shoulders of the W.R.A.F. officer. She is considered an expert in woman management and women's problems, and through knowledge and experience of her own sex must be able to form an opinion on the whole problem of realizing the full value of women in the Royal Air Force, besides being able to give balanced advice on details when the occasion demands.

In order to be of the maximum value, the W.R.A.F. officer must study her Service as a whole in relation to herself, her job, and her future. She can now plan her career with the expectation of long-term service, and a cursory glance at the promotion examination syllabus will be sufficient to give her some idea of the implications of becoming a regular officer.

An officer of any rank in His Majesty's Forces holds a unique and important position in this country—he, and now she, is expected to have qualities of leadership, initiative, courage and self-respect superior to most citizens, and moreover he or she is expected to be an influential and respected member of a democratic community.

She must understand the broad framework into which her job fits. She may be called upon to defend democracy—and may equally well be called upon to speak on that same difficult word at the station debating club. She may, in defence of our form of democracy, be suddenly placed in a position of close contact with an allied form of the same subject. Her Service and its finance are debated in Parliament in their relation to all matters affecting this country which she serves. She may be called on to represent her Service at meetings on a national or local level, of youth organizations, women's committees, or civic occasions to which she must rise with knowledge of their aims and achievements.

She may be posted overseas, and will become the representative of her country and its way of life. Apart from being continually on view, she will be asked questions about the women of England and their place in society and the answer will be better understood if it is given with comparative knowledge of the country concerned.

Nearer home she will need to understand not only how her Service works but why. She can never give a balanced decision on the greater problems of woman management unless she has knowledge—not only of the effect of the decision on airwomen themselves but also of its effect on the whole field of employment of air power.

She might well ask herself: "If an emergency arose, what would be a possible field of development at home—or area of combat overseas—where airwomen would be needed?" This question cannot be answered without a knowledge of the possible use of air power and its development. Again, asked to approve emergency quarters for airwomen on a mediocre airfield, she must, while trying to obtain the best possible conditions for the airwomen, be in a position to consider the strategic importance of that airfield and the necessity for posting of airwomen to its establishment, and weigh that against her natural desire for their comfort.

In peace time the Regular Service is aiming at the highest possible degree of efficiency and stability backed up by an ever-increasing reserve of trained men—which aim applies equally to the women—and the W.R.A.F. officer will be called upon to advise on the training of future women leaders. In war time, training was apt to be regarded as a thing apart, carried out only on courses and at special stations. But the practical side of administration and leadership training can be effectively practised only on the job, and the years of experience and trial and

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error have a far greater value than weeks on a course. The need is for a generation of women to develop within the Service, growing up with its problems, and understanding them through experience; having the ability to fit themselves into the R.A.F. framework; the foresight to follow Service developments with one eye open for their special bearing on women's employment; having a respect for Service customs, methods and ways of life, but always a broad outlook and an understanding of things outside the Service and outside the British Isles.

In 1939 one of our worst difficulties was the complete absence of any records or accumulated experience of Service administration of women. This must never be allowed to recur, and the experience gained in war time is the invaluable base on which to build the W.R.A.F.

But, given time to plan, study, experiment and develop, we cannot emphasize too strongly the need for a broad outlook—embracing not only the Service but the democratic system which it exists to defend.

Generations of women have lived lives far removed from the practical issues of a men's Service, and now, less than two generations removed from the suffragettes, they are called to fill a permanent place in that Service. A woman can be trusted to grasp the details; the W.R.A.F. officer needs to look beyond the detail. The woman is naturally a tactician—the W.R.A.F. officer needs to study broad strategic issues. The woman instinctively knows the rudiments of home management and child welfare—the W.R.A.F. officer needs to apply her instinct to the management of an even greater number of airmen and airwomen, barracks, messing, and technical equipment. The woman knows all that goes on in her village street or square—the W.R.A.F. officer should study events in her Service, nation and in the world, otherwise she cannot herself be an adequate officer and leader in the Service of tomorrow.

To sum up: the W.R.A.F. officer must know both her Service and her sex and must train herself to study the two as one problem. The R.A.F. should look on its women as regular members of the Service, fully capable of doing a man-sized job and fully liable for the penalties prescribed by the Air Force Act where necessary.

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More W.R.A.F.—R.A.F. teamwork. Parachutists

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The House of Commons

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THE AIR FORCES IN PARLIAMENT

DEBATE IN THE HOUSE OF LORDS

AN interesting debate on the strength of the Royal Air Force took place in the House of Lords on 2nd March, 1949, too late to be reported in the April number of THE ROYAL AIR FORCE QUARTERLY. A brief summary of the more important points is given here.

Viscount Templewood moved "That this House presses upon His Majesty's Government the urgency of strengthening the Royal Air Force in the interests of Home Defence, Western Union and Atlantic security." He had previously stated his belief that conscription was not the way to obtain skilled personnel for the Air Force and that National Service might even be harmful by diverting attention from the urgent problem of getting long-term skilled volunteers rather than a great mass of short-term personnel.

He quoted General Eisenhower, who had said: "The decision in a future conflict would be determined by our ability to act and react in the first sixty days." And the committee before which the General was giving evidence had stated categorically: "Our security [i.e., American security, but it applied equally to British security] includes, as always, winning any war we may get into. But it includes more than that. It includes not losing the first campaign of the war, if the loss would mean that the country would be invaded and occupied. It includes not having our cities destroyed and our population desecrated in winning the first campaign."

He complained that the Defence White Paper, and the Navy, Army and Air Force White Papers, left him and the public completely in the dark as to the defence plans of the Government. He had never before seen such White Papers. They were so white that there was not a speck of red blood or an inch of bone in any of them. The figures of recruiting showed that the Royal Air Force was failing to get the skilled personnel without which it could not be satisfactorily developed. One of the reasons, he suggested, was the rates of pay offered, which, even allowing for differences in value and in standards, were only one-half and in some cases one-quarter of the corresponding rates in the United States.

Referring to Lord Trenchard's demand, in a previous debate, for an Air Force of 550 squadrons for the Powers of Western Union and the Atlantic Pact, he suggested that Great Britain and the British Commonwealth should contribute at least 30 per cent., or, say, 180 squadrons: fifty long-range bomber squadrons, fifty long-range fighter squadrons, forty short-range fighter squadrons and forty transport squadrons. It was necessary that the countries of Western Union should show their military strength in the most unmistakable manner to reassure the weaker countries; and an overwhelmingly strong Air Force would greatly improve our relations with France.

Viscount Trenchard criticized the application of the principle of "balanced forces," and suggested that the "balance" required was not that which would appease each of the three Services separately but that which was determined by the job which had to be accomplished; and he demanded that the public be told how many of each kind of squadron the Air Force actually had. He also denied that there was anything seriously wrong with the morale of the Royal Air Force. Grumbling did not indicate low morale; but the work of the Air Force, e.g., in the Berlin air-lift and in the Aden hinterland, proved that morale was excellent.

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Turning to National Service, he said that nothing under three years would be any good as a period of service in the R.A.F. because it was not only technical skill and knowledge that were required but experience also. As to rates of pay, he said: "If you want the right type of man for the Royal Air Force you must pay him more than is paid in the case of the other Services"; and he gave the following reasons: (i) flying is a hazardous service and extra pay for aircrews would be "justified up to the hilt"; (ii) Air Force mechanics require greater skill than others because most of the machines they maintain are small, complex and delicate; (iii) any mistake made by a mechanic in the Air Service, whether in peace or war, is lethal; and (iv) if men cannot be obtained in any other way they must be obtained in that way.

Viscount Portal of Hungerford said that the supreme purpose of the Western air forces was to prevent a war breaking out and he suggested that every aircraft stationed in Europe might well be worth a great deal more than one equally good but located 2,000 or perhaps even 12,000 miles away. He also pointed out that, apart from publicity, the one and only thing which was keeping men and women from joining or rejoining the Service was that they could get better terms and conditions in civil life; and he urged the Government not to "nibble" at the problem. To solve the problem of housing airmen's families, he suggested "prefabs" or aluminium houses in large numbers.

Lord Vansittart drew a parallel between Russia now and Germany in 1938 and 1939. "Stalin," he said, "contemplates war . . . just as clearly as Hitler did . . . and would make war if it were safe. . . . Hitler could have been deterred and so can Stalin . . . and the first requisite to do that is a strong and really powerful Air Force now."

In replying on behalf of His Majesty's Government, Lord Henderson said that the Government were "fully alive to the vital importance of collective defence arrangements, capable of deterring a powerful aggressor and of successfully resisting an aggression if it occurs." They agreed that an efficient and powerful Air Force must be based primarily on Regular service. They could say with absolute assurance that in the Vampire and the Meteor they had the best fighters in the world. He explained the continued need for secrecy by stating that statistics published before the war had been used by the German intelligence staff. He also admitted that shortage of married quarters was a serious deterrent to the re-enlistment of skilled and experienced airmen.

—*"Hansard," H. of L., 2nd March, 1949.*

Defence Debates

Debates on Defence took place in the House of Commons on 3rd March, 1949, and in the House of Lords on 23rd March, 1949. (*Full reports will be found in "Hansard" of those dates.*)

HOUSE OF COMMONS

The Minister of Defence (Mr. A. V. Alexander), in moving the approval of the "Statement on Defence, 1949" (Cmd. 7631—H.M.S.O.; 4d.), which he himself had presented to Parliament in February, confined himself mainly to quoting from that White Paper and enlarging upon it.

In particular, he said that the Government had decided, last September, "in face of the deteriorating international situation to arrest the downward trend (in equipment and production) which had continued since the end of the war, and to arrange to accelerate the overhaul of the stocks of war-time equipment and to

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step-up new production in certain vital sectors. . . . The major re-equipment measures," he said, "in the year ahead of us will relate to aircraft and associated equipment, like radar, and some hundreds of additional jet fighter aircraft will be delivered during the year. . . . Economic recovery and defence, however, go hand in hand and the Services recognize this in determining the extent of the call which they feel they can make upon the nation."

Turning to man power, he said: "The review of our defence situation last summer led to the decision to arrest the rate of run-down of the Forces personnel." In spite of almost full employment, they had recruited for the three Services 250,000 Regulars since the war as compared with about 210,000 in the similar period after the First World War, and that indicated "a great deal of fine voluntary loyal spirit in the nation." He also promised some increase during the year in the financial provision for research and development.

Various members pointed out that, in spite of the figures given, recruiting was not satisfactory because the numbers of volunteers enlisted fell far short of the numbers actually required; and they drew attention to some of the obstacles to recruiting, e.g., insufficient pay, unattractive conditions as compared with those in civil life, shortage of married quarters and difficulties of resettlement in civil trade or business after discharge.

Mr. Oliver Stanley made a strong plea for more information as to the actual fighting potential of the Services and in particular for the number of effective squadrons in the R.A.F. and of divisions in the Army. It appeared that the Admiralty had already published details of the effective fighting units of the Fleet; and why, asked Mr. Stanley, could not similar details be published of the other two Services? Mr. Alexander said they could not be released for security reasons. Mr. Stanley and others also questioned whether the Government had any agreed plans for the reconstruction of the armed forces or ideas as to how they should be employed in an emergency.

The Conservative amendment complaining of "so little result in effective fighting power in return for the very large resources in man power and money already voted" was defeated; and the House approved the Statement on Defence, 1949, after a debate of six and a half hours.

HOUSE OF LORDS

On 23rd March the House of Lords debated defence policy as it may be affected by the Atlantic Pact. Lord Swinton opened the debate by complaining that there seemed still to be no "comprehensive over-all plan" for defence. There was only one potential aggressor, he said, and we knew his powers and limitations; we also knew who were our friends and allies. He called for assurances that a bomber force was being provided and that bomber crews and ground staff were being properly exercised. He also called for anti-submarine measures to be planned. The over-all plan should include the Commonwealth and Empire, for future war would be sudden and universal and there would be no time to lose.

The Earl of Perth said it was absolutely necessary to have "an efficient and powerful Air Force capable of giving to this country and its friends complete air superiority against aggression," and service in the R.A.F. would have to be made more attractive in order to secure good volunteer recruits. The Earl of Cork and Orrery warned the House that "the conclusion of the Atlantic Pact accentuated the danger of the moment." The Russians, he said, might be able to advance anywhere on the line from the North Cape to the Mediterranean, and Stalin might decide that this should be done now or never.

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Lord Portal of Hungerford also called for a plan and pointed out that there were always good reasons for waiting; but there were better and stronger reasons for stating a plan now and giving the Chiefs of Staff something to work on. Lord Trenchard said that any little advantage that might be given to the enemy (by a declaration of defence policy) would be outweighed by the advantage of giving confidence to other countries and to the Services. The total air force of the Empire and America should, he suggested, be about 550 squadrons, of which the Commonwealth should contribute about one-third; and he would like to see a strong navy, including that of America, composed of 1,000 small, fast ships, partly jet-propelled, doing 30 to 40 knots and heavily armed to deal with the submarine menace. As to land forces, he said the Commonwealth could provide about five or six mechanized divisions and five or six infantry divisions; and from these an expeditionary force could be found. Such naval, land and air forces would be as effective, in preventing the possibility of war, as the Atlantic Pact and the Pacific Pact.

Lord Pakenham, on behalf of the Government, said that rapid progress was being made in the equipment of the R.A.F. with jet fighter aircraft. Post-war recruiting figures were not satisfactory and must be improved. The Government could not give more information (about defence) because that would be hailed with glee by the Russians, whose foreign policy was the sole cause of our increased defence expenditure. Now that the Atlantic Pact had been framed, important decisions could be taken which hitherto had had to be left unsettled until this further stage in the scheme of collective defence was clear. Only now could we discuss the contribution of each partner to the common defence burden. He submitted that, in the circumstances, no further progress could have been made than had in fact been achieved.

Opposite is the "Correspondence Column." If readers have any criticisms of the new format in which "The Royal Air Force Quarterly" is now issued, or of opinions expressed by contributors of any articles appearing in this number of the journal, they are requested to write to the Editor, c/o Messrs. Gale & Polden Ltd., The Wellington Press, Aldershot.

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LETTERS TO THE EDITOR

To the Editor of "The Royal Air Force Quarterly"

SIR,

During the last tribal struggle the country suffered miserably from a thing called "the black-out." This brought fortunes to black-cloth manufacturers, irritated millions, led to fantastic prosecutions and (I suggest) created a state of jitters and inconvenience entirely out of proportion to any results it might have achieved.

Significantly, a "blacked-out" town became illuminated as in daylight by reflections from searchlights: thus negativing the totally vast efforts of the Browns, Smiths and Joneses in blotting out every chink of light in their humble homes.

Therefore I ask: What good did the black-out do? And, if any good was done, was it outweighed by the ridiculous upheavals it made in the lives of remote villages and sleepy towns, and, as always, to the bovine motorists?

Surely modern navigational aids and means to bomb a site unseen made the whole scheme one of those Whitehall triumphs which so pleased the enemy? What do experienced bomber pilots think?

Yours faithfully,

B. T. HURREN.

The Royal Aero Club,
119 Piccadilly,
London, W.1.

* * * *

To the Editor of "The Royal Air Force Quarterly"

SIR,

Inspired by your repeated invitation and encouraged by Vulcan's letter in the April number of THE ROYAL AIR FORCE QUARTERLY, I venture to offer a few comments on Mr. W. G. Sheppard's article "Selection for Leadership in the R.A.F." which you published in the same number.

No doubt it was limitation of space which prevented Mr. Sheppard's developing his theme farther; but truly, sir, the theme calls for further development. What, for instance, has Mr. Sheppard to suggest as valid tests for leadership (*a*) in the lower ranks and (*b*) in the higher ranks? And is it really true that tests that are valid for (*a*) cannot also be valid for (*b*)?

Surely, sir, the power to influence others, which is a part of leadership, is the same essential quality in both junior and senior officers; if so, the same test will do for both. And since it is an innate quality it can be tested at an early age.

As to the additional qualities required in senior officers, e.g., professional knowledge, experience, and the ability to weigh all the factors in a complicated situation and to make a right decision, these are developed later on and can be, and in fact are, revealed partly by written examinations for promotion and the Staff College and partly by the subject's own performance of his duties in successive ranks and appointments.

I am, sir,

Your obedient servant,

R. F. PEMBERTON (Wing Commander).

Headquarters, Fighter Command, R.A.F.,
Bentley Priory,
Stanmore, Middlesex.

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SPORT IN R.A.F. PRISONER-OF-WAR CAMPS

By Squadron Leader P. A. Ward-Thomas

CONSIDERABLE publicity has recently been given, by means of radio broadcasts and books, to the fascinating stories of escape from prisoner-of-war camps. While these outstanding examples of ingenuity, courage and endurance deservedly attract attention in view of their inherent dramatic qualities, there were other aspects of that strange existence, possibly not so apparent to the lay mind—aspects which, although lacking the romantic appeal of an adventure story, still illustrated no less effectively the genius for improvisation so characteristic of the British in adversity.

In Allied prisoner camps escaping naturally took priority over all else. The opportunity to escape might occur at any time, therefore it was a prisoner's first duty to keep himself as fit, mentally and physically, as possible. Any attempt to gain freedom almost always imposed severe demands on the nerves and physique. Also there was the future life to be considered: a man's faith in the ultimate victory of his country and his eventual return to career, family and friends was at all times a powerful incentive to maintain health.

Hundreds of men endured four, and in some instances five, years of prison-camp life and yet within a few weeks of returning to England were passed fit for flying. This and the fact that, with very few exceptions, they were able to resume normal life without any serious abnormality is a tremendous testimony to their spirit. R.A.F. prisoners of war were young, fit men who, up to the time of captivity, had mostly led individual, active and exciting lives. To be divested of this individuality and confined with hundreds of others in, to say the least, severely ascetic conditions was a great strain to many. The transition was horribly sudden. They needed an outlet for their energies, both mental and physical. The playing of games provided this escape valve. Cramped space, barbed wire and lack of proper equipment acted as a spur rather than a deterrent to their efforts.

In the first year of the war very few prisoners were taken and the Germans guarded these zealously and suspiciously. Opportunities for physical activity were rare. Apart from Dulag Luft, the transit and interrogation centre where the majority of prisoners remained for only a few days, the conditions under which they lived were restricted to a degree. The first camp to confine R.A.F. officers was the ancient Schloss of Spangenberg. Situated on the point of a hill and surrounded by a moat, it provided no facilities for sport apart from a space of some thirty yards round a small building which was used as a gymnasium. This the prisoners were allowed to visit for short periods and being on the outside of the moat they were closely guarded. The only compensation of Spangenberg was a magnificent view of the surrounding Harz Mountains.

It was not until late 1941 that Red Cross parcels began to arrive regularly. Without these any sustained mental or physical effort was not possible and prisoners usually took their exercise pounding round the perimeter of the camp. At Spangenberg this consisted of a courtyard forty by fifteen yards.

The first proper camp to be opened for R.A.F. officers and N.C.Os. was at Barth, on the Baltic coast, Stalag Luft I. Here the living conditions were not so crowded—three or four men to a room—but again the only facility for games was a small football pitch in a separate compound. At most the prisoners were allowed to visit this twice a week and then under guard. Although conditions in

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N.C.O. compounds or camps were generally more rigorous than for officers, the men were no less keen and organized their games with great enthusiasm. Inter-compound football and boxing matches were played and in the winter the football pitch was banked and flooded for skating. The clothing situation was critical and the footballers were often hard put to accoutre themselves, appearing in tattered underwear and shirts—a spectacle not without humour. As the pitch was situated near a small wood and to reach it prisoners were taken outside the wire, several attempts to escape were made which always resulted in its use being forbidden for a period. The Germans always "bolted the door after the horse had fled."

Conditions were unsettled in 1940-41. The Germans had made no provision for prisoners of war, and it was not until the opening of the much-vaunted camp at Sagan—Stalag Luft III—in 1942 that the prisoners' life became more stable. Prior to then there were always moves or rumours of moves. Parties of prisoners were shunted around Germany. They were sent to an evil-smelling fort in Poland, where conditions were quite impossible, as a reprisal for alleged ill-treatment of German prisoners in Canada, back to Spangenberg, to Poland again to another camp, better in many ways and not so restricted from the physical viewpoint. But it was winter time and, apart from skating and a minute football pitch, little could be done. However, during this period four hundred R.A.F. officers were sent to Warburg, near Kassel, where for almost a year they were together with two thousand five hundred Army officers and men in what was the largest single compound in Germany.

Although the camp on arrival was a sea of mud and cinders, there was at least space, and before long a nearly full-size football pitch was made as well as a small rugby ground. The Y.M.C.A. and Red Cross had now become aware of prisoners' needs other than food, and, once a camp had been established for some months, supplies of books and sports equipment were forthcoming. This was the case at Warburg. Immediately a football league of six clubs was formed, one R.A.F. and five Army. Competition was tremendous. The standard of play was quite high, especially in the N.C.Os.' team, and an atmosphere of enthusiasm and rivalry developed far in excess of any amateur game in this country. A few steel golf clubs appeared, but were immediately confiscated by the Germans, who regarded them either as potential escaping tools or as a contribution to their armament factories.

There were several first-class rugby players of international and county standard, and around them teams were formed. A seven-a-side tournament was organized; over sixty teams entered and it resulted in one of the most popular events held during the war. One R.A.F. team, appropriately named the "Old Lags," consisted of men shot down prior to October, 1939. They had then been prisoners for nearly three years, but they won the competition, to the unbounded delight of the R.A.F. The team included an All-Black trialist (the first officer prisoner of the war), an ex-Cranwell captain and a Midlands county player.

In the summer a cricket pitch was laid on the rugby ground. There was no grass, only bare earth, so wet tennis balls were used. A bucket of water was placed where the sawdust heap would normally be, and woe betide the batsman who failed to notice when the bowler wetted the ball as it flew from the ground with considerable velocity. Meanwhile, in another corner die-hard enthusiasts had prepared a tennis court. The labour involved in levelling the coarse earth was enormous, but it was accomplished and for a while some excellent tennis was produced. This was the only occasion in R.A.F. camps on which tennis was possible; elsewhere the surface of the ground was hopeless. Grass was a half-forgotten myth.

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Except in the winter, when snow and mud made games impossible, sport of some kind was in progress all day. Even for those not taking part, merely to watch represented some diversion, and if one was of a partisan nature or liked to bet, the game was more than a diversion. Thus at a league soccer match or an international the atmosphere was not unlike that of a cup-tie in England, and for the average person to play in front of a highly critical and wildly excited crowd of a thousand or more was quite an experience. It was entirely different from playing before a crowd at home; in Germany nearly everybody knew one, and the fear of making a fool of oneself was considerable.

The camp at Warburg was closed in September, 1942. The R.A.F. were split, some going to open Stalag Luft III and others to their winter resorts in Poland. Much has already been written about the camp at Sagan which housed the great majority of British and American Air Force officers. Poor though conditions were, to the weary travellers from the forts of Poland it was a great improvement. There were in 1943 three compounds; two more were added later to accommodate the influx of Americans. From the sport viewpoint the East Compound was probably the most remarkable, in that, despite being the smallest, 330 yards by 130 yards, games were more highly organized there than in the other compounds. The camp was in a large clearing of the forest of Sagan and the surface consisted of loose sand blackened with pine loam. A losing battle was constantly being waged with the sand to try to make a level surface for games, but despite endless scraping and shovelling it soon became loose and rough again. Football or rugby on such a pitch was extremely strenuous, especially as the normal seasons were ignored and these games were often played in temperatures approaching 90 degrees—literally in a bath of sand and sweat.

Rugby was not played to the same extent as soccer. The games became too violent as people let off steam; injuries were not infrequent and eventually it was abandoned as a camp sport. Rugby did, however, enable a spectacular rescue of a man from a tunnel to be made. The Germans held their check parades in the morning and afternoon on the football pitch, where the prisoners were assembled in companies of five ranks. One such company fell in daily within a few yards of the wire, and as the parades usually lasted about twenty minutes a tunnel was begun, the sand being dispersed amongst members of the company. Eventually the hole was big enough for a man to be put down and sealed in during a morning parade after the company had been checked, and brought up on the afternoon parade before the counting officer reached that company. On occasions the Germans would not bother to hold an afternoon parade and so the problem arose of how to extricate the man from the tunnel. He could not have lived through the night. The football pitch was in full view of two guard towers, and obviously any large group suddenly collecting for no apparent purpose would immediately arouse suspicion. A rugby game of about twenty-a-side was therefore organized and eventually a huge scrum formed over the entrance to the tunnel; the sand was scraped away, the trap lifted and the man rescued. The tunnel was then sealed again. Fortunately the Germans knew nothing of the rules of rugby.

Soccer continued with unabated enthusiasm. A league was formed with eight clubs, each bearing a famous name—Aston Villa, Arsenal, etc.—and each running four teams. The size of the pitch, eighty yards by forty yards, restricted the games to seven-a-side, but even that meant at least one game per week for two hundred or more people. By mid-1943 sports equipment, although never plentiful, had arrived in sufficient quantity for anyone who was interested to play any game. In each compound there was a proportion of N.C.Os. and other ranks who acted as orderlies and they formed a strong nucleus of the soccer teams. Matches

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between officers and N.C.Os. perplexed the Germans, whose conception of democracy was somewhat less enlightened.

As the war progressed more men from the Dominions arrived in the camp, and soon baseball, or rather a revised form called softball, made its appearance under Canadian guidance. It rapidly gained in popularity and even the most ardent cricketers were soon forced to admit its excellence. The incessant badinage amongst the players was a perpetual source of humour. The Canadian influence was also responsible for ice-hockey matches. The hockey sticks sent out were often made of hickory and frequently purloined to reshaft the early wooden golf clubs. A rink was constructed on the football pitch, levelled and banked. When the frosts set in it was flooded, and thanks to a large supply of skates much pleasure was afforded and many learnt to skate, to the amusement of the less intrepid.

Each summer an athletic meeting was held with all the usual events, and this involved prodigious work in levelling a 220-yard track. The sand was harder near the wire where people walked round the circuit and, inch by inch almost, a five-line track was levelled. The great day of the meeting gave the camp a gala appearance with the posts and home-made flags. The bookies always did a roaring trade. For weeks the athletes had been training and, considering their diet, some excellent performances were recorded.

The arrival from England of coconut matting and the successful persuasion of the Germans to lay a concrete cricket pitch allowed a short but eventful and crowded season. There was a fair supply of bats, often oiled with sardine oil; hard balls were used and so it really was cricket. The concrete was laid in two sections with a gap in the middle of about six yards, so any attempt to bowl fast bumpers was frustrated, as the ball hit the soft sand short of the concrete and rolled tamely towards the batsman. For six weeks cricket was played for roughly eight hours a day, then the matting was sent to another compound for their turn. The boundary on one side was a hut within thirty yards and many a tea party was interrupted by a powerful pull or lofted drive. Windows were somewhat naturally left open. With an Australian Sheffield Shield player and an outstanding England-class amateur, together with many good club players, some quite good cricket was obtained. Minor games, such as basketball and deck tennis, also had their enthusiasts and the summers of 1943 and 1944 probably saw more concentrated and varied sport taking place in a small area than anywhere else in the world.

During 1943 the majority of British and American N.C.Os. were moved to Stalag Luft 6, near Memel. The sport tradition continued unabated. British and American football was played, international boxing matches held and the final England—Australia test match was completed only a matter of hours before the Russian advance caused the evacuation of the camp.

The outstanding event of this period was undoubtedly the construction of a golf course. It began in a small way; a few people hitting balls made of string covered with elastoplast, with a lady's old wooden mashie. The first course entailed holing out against posts or tree stumps. Interest grew rapidly. Someone made a green or "brown," levelling the earth and building bunkers around it. Competitions were started and soon fifty or more people were playing. There was still only one club which miraculously withstood the strain of hitting more than 250,000 shots, often in the hands of powerful but inexperienced players. Gradually more clubs arrived from many different countries, a proper nine-hole course with immaculate "browns" was laid and the golf mania spread. The "browns" were approximately eight yards square and when scraped level and covered with sifted sand made very true putting surfaces, especially after rain. The length of the course was 850 yards

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Golf ball made by the author whilst a prisoner of war

and the longest hole 140 yards. Par was 29 and the course record 57. By 1944 over a hundred clubs had arrived and about three hundred men were playing. The keenness was astounding: the experts gave lessons and men were swinging and practising all day. Every kind of competition and match was held and the players were given handicaps.

The Germans interfered only once, flattening the course after the discovery of the wooden-horse tunnel, but they soon allowed its reconstruction, a matter of two days' hard work. Otherwise they were indifferent except perhaps when one golfer rocketed his shot from the seventh tee through an "abort" window, interrupting with a shower of glass the constitutional of the German seated inside.

The evolution of ball manufacture was remarkable. Beautifully made rubber balls with hard cores and covered with tightly sewn leather followed the early pudding-like objects. Any kind of rubber, from gym shoes, tobacco pouches, air cushions, etc., was soon at a high premium. The best balls made were only ten to fifteen yards short of a real golf ball when hit with a five or six iron (the ball in the illustration is a very average example and even this has been hit well over 200 yards). The figure-of-eight stitching employed for the leather cover compensated aerodynamically for the lack of marking. They flew extremely accurately. When more clubs began to arrive real balls came too, but their use was forbidden unless the gutta-percha cover was replaced by a leather one. However, occasionally an exhibition match was staged between the camp's best players. The course was

On the "Brown." Watching a competition

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stretched to 1,500 yards, real golf balls were used, and a gallery of several hundred would watch with the same silent attention as at a big match in England. To play in front of this gallery was at first an ordeal, but one soon appreciated why it is that professionals like them.

It may be imagined that when golf was in full swing in such a small area it could be extremely dangerous, but oddly enough no one was ever seriously hurt, although the border between laughter and tragedy was often very narrow. Golf caught the imagination of the prisoner as no other game had done. It became an established part of the daily routine for scores of people, many of whom had never touched a club before in their lives, and who through assiduous practice found themselves well out of the "rabbit" class when they returned home.

To a visitor from the outer world on a day in high summer the camp would have presented an astonishing spectacle. Everywhere men, in various degrees of nudity, were throwing, hitting or kicking balls from morning until sunset. Intent figures plodded round the golf course, runners trained on the circuit, footballs hurtled over the wooden horse, which was near one of the goals, and violent cries came from the baseball diamond. However humorous or trivial it may seem in retrospect, all this activity accomplished its purpose; it represented health, amusement and diversion and, above all, helped to pass the weary years.

SPORT IN THE R.A.F.

By J. Sephton

DURING the winter season 1948-49 inter-station and inter-command competitions have been organized in twelve different sports—association football, badminton, basketball, boxing, cross-country running, fencing, hockey, netball, rugby football, road walking, squash rackets and table tennis.

ASSOCIATION FOOTBALL

The Royal Air Force Football Association this season reverted to the pre-war function of holding a Junior and Senior Competition.

Both these competitions were keenly contested, and ninety-five units under a strength of 500 entered the Junior, R.A.F., Mildenhall, being the ultimate winners, beating Headquarter Unit, No. 1 Group, by 1 goal to 0 in the final, which was held at the Stadium, Cranwell.

In the Senior, R.A.F., Halton, defeated R.A.F., St. Athan, by 2 goals to 1 at the R.A.F. Stadium, Uxbridge, before a crowd of about 3,000 spectators. One hundred and six stations entered this competition. The Inspector-General of the Royal Air Force, and the President of the R.A.F. Football Association, Air

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Marshal Sir Leslie N. Hollinghurst, K.C.B., K.B.E., D.F.C., presented the trophy to the winning team, and medals to the winners and runners-up in both of the competitions.

Inter-Services Association Football

The Royal Navy won the Inter-Services Soccer Championship this year, beating the Army by 2 goals to 1, and drawing 1—1 with the Royal Air Force.

R.A.F. Footballers Unbeaten in Far East Tour

A football tour by flying-boat through British North Borneo and Sarawak has been made by No. 209 Hong Kong Squadron's soccer XI. The team, based at Seletar, near Singapore, were able to make this tour by flying in the Sunderland in which Air Vice-Marshal A. C. Sanderson, Air Officer Commanding, Malaya, was making an inspection tour of landing fields and flying-boat anchorages under his command.

Opening the tour with a goalless draw with the Kuching (Sarawak) Football Club, a match fought in torrential rain, the R.A.F. players flew to Jesselton, capital of British North Borneo, to beat a local side by 4 goals to 0. The home team included several Malay constables from the North Borneo Constabulary.

A 3—0 win over a Chinese XI at Sandakan, in which Flight Lieutenant L. Dolphin scored all the goals, ended the tour and avenged a previous 4—0 defeat suffered by the Hong Kong Squadron at the hands of the Chinese team.

RUGBY UNION

Wing Commander J. Lawson, O.B.E. (ret.), for two years Secretary of the R.A.F. Rugby Union, a familiar figure at every important R.A.F. rugby match

In the Inter-Unit Rugby Competition 128 units competed, which is the largest entry every received in the history of the Union. R.A.F., Stradishall, defeated No. 16 M.U., Stafford, in the final, played at R.A.F. Station, Wittering, by 19 points to 3. The Chief of the Air Staff and President of the R.A.F. Rugby Union, Marshal of the Royal Air Force The Lord Tedder, G.C.B., witnessed this game.

In the Inter-Services Championships the Royal Air Force and the Army became joint champions, both beating the Royal Navy, and the R.A.F. *v.* Army match resulting in a draw of 3 points each. Two members of the R.A.F. team represented their countries during the season: Flight Lieutenant E. L. Horsfall, R.A.F., Mildenhall, was selected for England, and Flight Lieutenant I. J. M. Lumsden, R.A.F., Abingdon, played for

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Scotland. Seven members of the R.A.F. team played for the Combined Services team against the champion county, Lancashire, at Blundellsands on 13th April.

The R.A.F. Rugby Union owe a debt of gratitude to Wing Commander J. Lawson, O.B.E., who for twenty-three years was their very active Secretary, and to whom much of the success of their achievements is due. On his retirement, despite the arduous duties of his new appointment as Director of R.A.F. Sport and Inspector of Recreational Grounds, he still finds time to carry on his task as Secretary to the Rugby Union.

BOXING

The Lord Wakefield Novices' Boxing Tournament proved to be the high-light of the boxing season. In the junior tournament two competitions were held, one for officers and the other for airmen. R.A.F., Boscombe Down, won the officers' competition and R.A.F., Spitalgate, the airmen's.

In the senior tournament twenty-three stations competed, which means that approximately 184 boxers entered the ring. R.A.F. Stations, Kirkham, St. Athan and Cardington tied for first place with 36 points each.

The Officers' and Airmen's Individual Championships were held at R.A.F., Halton, on 4th, 5th and 6th April, 1949.

In all, 186 boxers competed for the titles and also the right to represent the Royal Air Force in the Imperial Services Championships at the Albert Hall.

BADMINTON, BASKETBALL AND TABLE TENNIS

Three new associations were formed during the winter months—badminton, basketball and table tennis. All held inter-station competitions, the Badminton and Table Tennis Associations also holding individual and inter-command competitions.

All those competitions were highly successful. At the moment the Table Tennis Association organizes the sport only for the W.R.A.F., but it is hoped to incorporate the R.A.F. next season.

The foregoing summary of the winter activities shows that all the R.A.F. associations are flourishing, and are catering both for the gladiator and for the tyro.

The summer programme is now well in hand, and the main associations are going ahead with their arrangements for individual, inter-station and inter-command championships.

ATHLETICS

The R.A.F. Athletic Association Individual and Inter-Command Championships for both the R.A.F. and the W.R.A.F. were held at the R.A.F. Stadium, Uxbridge, on 6th, 7th, 8th and 9th June. The high-light of the athletic season is the Inter-Service Championship, which is to be held at the Command Stadium, Aldershot, on 27th July. It is hoped to give details of these championships in the next number of this journal.

LAWN TENNIS

The R.A.F. Lawn Tennis Championships will again be held at the All-England Lawn Tennis and Croquet Club, Wimbledon, during the week commencing Monday, 25th July, with the Inter-Services Tournament, also at Wimbledon, on 1st and 2nd August.

There will also be inter-station competitions for both R.A.F. and W.R.A.F. during the season which will be organized on the zoning basis to eliminate unnecessary travelling.

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CRICKET

An outstanding number of entries totalling 155 has been received for the R.A.F. Cricket Association's Inter-Station Competition. This is not only a record for cricket but is the highest number of entries received for any R.A.F. winter or summer sport, with the exception of soccer, which runs two competitions.

Seven representative matches have been arranged against some of the leading counties, and the inter-Services matches against the Royal Navy and Army are to be played at Lord's on 16th and 18th July and 27th and 28th July respectively.

The inset picture is of Flight Lieutenant A. C. Shirreff, Hon. Secretary, R.A.F. Cricket Association, and captain of the R.A.F. XI and the Combined Services team. He also plays for Hampshire when Service duties permit. A right-arm, medium-pace bowler, he can be classed as a good all-rounder; against the Army at Lord's in 1947 he scored 120 not out.

Flight Lieutenant A. C. Shirreff, captain of the R.A.F. cricket XI and the Combined Services team; he also plays for Hampshire

GOLF

The R.A.F. Golfing Society has arranged to hold its Summer Meeting at Moor Park Golf Club, Herts, on 1st July. It is hoped to include the results in the October number of this journal, together with those of the Autumn Meeting, which is being held at Walton Heath Golf Club on 6th, 7th and 8th September, at which the Ladies' Section will play its championship.

The R.A.F. Golf Club at Habbaniya, Iraq, has been re-formed and a new nine-hole course has been opened.

MODERN PENTATHLON

The R.A.F. Modern Pentathlon Association has been re-formed and individual and inter-command championships will be held this year during July.

Owing to the difficulty of obtaining horses, the R.A.F. Championships will be restricted to four events—fencing, cross-country running, shooting and swimming. The competitors who do well in the R.A.F. Championships will be considered for the R.A.F. representative team which will compete in the British Championships later in the year. The British Championships will include all the above events and horse riding. It is therefore essential that personnel selected for the R.A.F. team must in addition to the four events acquit themselves well in horsemanship.

SWIMMING

The R.A.F. Individual and Inter-Command Championships will be held at R.A.F. Station, Cosford, on 7th, 8th and 9th September, with the Water-Polo

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Aircraftman J. Service, Scottish champion, Open 200 Metres Breast-stroke, and member of the Great Britain 1948 Olympic team

Championships, also at Cosford, on 15th and 16th July.

Three members of the Great Britain 1948 Olympic team are now in the Royal Air Force—Pilot Officer R. G. Franks (Otter Swimming Club), Aircraftman J. Service (Glasgow Central) and Aircraftman J. Elliott (Highgate Diving Club).

In addition to these three outstanding swimmers the Royal Air Force has now in its ranks several members of the country's leading swimming clubs and should, therefore, be in a sufficiently strong position to retain the Inter-Services Championships, which this year are being held at the Seymour Hall Baths, London, on 14th September.

The new Chairman of the R.A.F. Swimming Association is Wing Commander C. D. Tomalin, D.F.C., A.F.C.

CYCLING

The newly formed R.A.F. Cycling Association is holding individual and team trial championships over distances of twenty-five, fifty and a hundred miles during the summer months, closing the season with a 100-kilometre Mass Start Team Championship at R.A.F. Station, St. Athan, on 10th September.

RIFLE SHOOTING

Competing in the Berlin Individual .22 Rifle Shooting Championship as the only R.A.F. representative against seventeen male entrants from British Troops, Berlin, and the Control Commission, Germany, a member of the Women's Royal Air Force, Sergeant Elizabeth Winifred Thorns, obtained the third-highest score and was placed fourth. She was only eight points behind the winner, who scored 191 out of a possible 200, and she missed a prize by only two points, second and third prizes going to competitors who tied with 185.

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Air Chief Marshal Sir John C. Slessor, G.C.B., D.S.O., M.C.

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BIOGRAPHY: AIR CHIEF MARSHAL SIR JOHN SLESSOR, G.C.B., D.S.O., M.C.

By A. H. Narracott

NOBODY more faithfully personifies the fighting spirit of the R.A.F. than does Air Chief Marshal Sir John Slessor, G.C.B., D.S.O., M.C., the present Commandant of the Imperial Defence College. The out-thrust chin, the nose which looks as though it has made close acquaintance with a fist (or, at any rate, a hostile boxing glove), and the keen, penetrating eyes all speak of a forceful, active personality possessing that degree of pugnacity which is the essential attribute of a successful leader of a fighting service.

Those who know the R.A.F. best will tell you that it has few keener brains than that of Jack Slessor, as he is popularly known. His qualities are proved by the fact that he was a temporary major in the R.F.C. at the age of 21, an air marshal at 48, and an air chief marshal at 49. Though he has never served in the Army, much of his Service life has been spent in close association with that Service, and he was an instructor at the Army Staff College for some years in the early thirties. In 1936, when a wing commander, he attracted wide attention by a very remarkable book entitled "Air Power and Armies," in which he discussed the relationship of land and air forces in a war of the future. The views he expressed then showed his deep understanding of the fundamental changes in land warfare which the development of air power had wrought.

In the same year (1936) Wing Commander Slessor won the Gold Medal of the Royal United Service Institution for an essay on an Army subject—the effect of the introduction of the internal-combustion engine on the tactical and administrative movements in modern armies.

John Cotesworth Slessor was born at Rhanikhet, India, in 1897 and joined the R.F.C. as a second-lieutenant in 1915 at the age of 18 direct from Haileybury, seeing service in the Middle East and France. He was one of the first pilots to be engaged in the night defence of London against Zeppelins in the autumn of 1915, and in 1916 collected an M.C. and a large lead slug in the leg in the final action of the Sudan operations before El Fasher. After another tour of operations in France in 1917 or 1918 he ended the First World War as acting Commandant of the Central Flying School at Upavon.

After a period of service as a flight commander in the first flying training school to be reopened after the First World War, at Netheravon, Slessor—who had dropped back to the rank of flight lieutenant—served in India with No. 20 Squadron and at Air Headquarters. He passed through the 3rd Course at the Staff College and in 1925 took over No. 4 (Army Co-operation) Squadron at Farnborough for three and a half years. In 1928 he joined Lord Trenchard's staff in the Air Ministry as one of the two officers in the then diminutive Plans Branch, whence he became an instructor at Camberley under the great soldier who later became Field-Marshal Sir John Dill. One of the interests he shared with his Commandant was a passion for galloping over fences with the Staff College Drag. In February, 1935, he left to command No. 3 (Indian) Wing at Quetta, and was there during the disastrous earthquake. In 1936 he commanded his wing in the

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Waziristan operations, where something remarkably like the modern technique of air support was first developed, and was awarded the D.S.O.

In May, 1937, Slessor relieved Group Captain A. T. Harris in charge of Plans at the Air Ministry, in which capacity he served until the end of 1940, when he was sent to the United States on a special mission, remaining there as the R.A.F. representative on the first Anglo-American Staff conversations—the A.B.C. conversations—in early 1941. He commanded No. 5 (Bomber) Group from April, 1941, until April, 1942, when he was recalled to the Air Ministry to undertake the new appointment of A.C.A.S. (Policy).

Air Marshal Slessor was next called upon to lead Coastal Command at the most critical period in the long, grim struggle against the U-boat. After attending the Casablanca Conference in January, 1943, where the Combined Chiefs of Staff agreed that the defeat of the U-boat should be the first charge on Allied resources, he took over at the beginning of February from Air Chief Marshal Joubert. During the following year close co-operation between Coastal and the Royal Navy gave the U-boats their worst beating of the whole war. To win the Battle of the Atlantic was, of course, the primary job of Coastal Command in that year, and in fact the Command made no mean contribution to that end, killing a total of eighty-five U-boats between February, 1943, and February, 1944. Slessor's offensive policy and his belief in the gallantry of his crews were amply vindicated by the results of what was known as the "Bay Offensive," during one month of which (May, 1943) no fewer than seventeen U-boats were killed by the Command, mostly in transit through the Bay of Biscay. Attacks on enemy coastal shipping off the Norwegian, Dutch and French coasts were also intensified, and paid useful dividends as a supplement to other air operations against enemy rail and inland water communications. Success was also achieved against German blockade-runners in the Bay of Biscay. In August, 1943, Sir Archibald Sinclair, the Air

Sir John Slessor with his old friend Lieutenant-General I. C. Eaker, K.C.B., K.B.E., D.S.M., D.F.C.

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Minister, sent Air Marshal Slessor, on behalf of the War Cabinet, a message of congratulation on his Command's achievements.

Having scored a notable success at Coastal Command, at the beginning of 1944 Air Marshal Slessor was appointed Commander-in-Chief, R.A.F., Mediterranean and Middle East, and deputy to his friend General Ira C. Eaker, Air Commander-in-Chief, Mediterranean Allied Air Forces. As such he was concerned with the land and air operations in Italy and the invasion of Southern France, and in the summer of 1944 formed the Balkan Air Force for the support of Marshal Tito's partisans. Marshal Tito presumably now finds it convenient to forget that he would in all probability have been eliminated by the Germans but for the support of the British, South African and Greek squadrons of the Balkan Air Force and the continuous air supply and evacuation of his wounded by the R.A.F. and American transport aircraft in 1944 and 1945.

In March, 1945, Slessor returned to the Air Ministry to become Member of the Air Council for Personnel in succession to Air Marshal Sir Bertine Sutton, and was promoted to air chief marshal in January, 1946. In his capacity as A.M.P. he had the grave responsibility of handling the complexities of the tremendous run-down of the Service from a strength of over a million to some 300,000. It was his somewhat thankless task to supervise the smooth demobilization of the great war-time R.A.F. while at the same time trying to lay the man-power foundations of a new peace-time service.

Sir John Slessor has been Commandant of the Imperial Defence College since the last day of 1947, when he succeeded General Sir William Slim. In 1948 he became Principal Air A.D.C. to the King.

Lady Slessor is a very active worker on the R.A.F. Benevolent Fund and on the Council of the S.S.A.F.A., and their only son is now carrying on the tradition as a Regular officer in the R.A.F.

BATTLE OF BRITAIN WEEK

Battle of Britain Week will be observed this year from 12th to 18th September.

Battle of Britain Day (Thursday, 15th September) will be celebrated in the usual way, including colour-hoisting parades and other appropriate ceremonial, at all R.A.F. stations.

The R.A.F. "At Home Day" will be Saturday, 17th September, when a number of R.A.F. stations will be open to the public, and on the following day (Battle of Britain Sunday) there will be the customary thanksgiving services.

Details of the programme for the observance of the Week will be issued at a later date.

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CONCERNING PERSONNEL

HONOURS AND AWARDS

THE KING has been graciously pleased to approve the following awards:

GEORGE CROSS (POSTHUMOUS)

Assistant Section Officer NORA INAYAT-KHAN (deceased), W.R.A.F.

The first woman operator to be infiltrated into territory occupied by the enemy, in the principal and most dangerous post in France. Although, after mass arrests, she was given the opportunity to return to England, she remained at her post and did excellent work. After three and a half months she was betrayed to the Gestapo, but she refused consistently to give them information of any kind. During imprisonment she made two unsuccessful attempts at escape and was subsequently sent to Karlsruhe in November, 1943, and then to Pforsheim. Interrogated by the Gestapo at both prisons, she still refused any information whatever. She was then taken to Dachau Camp in September, 1944, and on arrival was taken to the crematorium and shot.

MILITARY DIVISION OF THE MOST EXCELLENT ORDER OF THE BRITISH EMPIRE

As Commander

Acting Group Captain JOHN MORTIMER WARFIELD, O.B.E.

As Senior Air Staff Officer, Malaya, since the beginning of the operations, he arranged all the operations in which the R.A.F. has taken part, winning the regard and esteem of everyone connected with these operations by the excellence of his staff work.

As Officers

Wing Commander HENRY NIGEL GEORGE WHEELER, D.S.O., D.F.C.

Wing Commander Wheeler commanded the original Malayan task force and later R.A.F. Station, Kuala Lumpur. He showed great initiative in organizing all the accommodation and administering the personnel. He commanded all the units operating there and was responsible for the execution of operational orders from Advanced Air Headquarters.

Squadron Leader ALLAN GEORGE HAMMOND

As Squadron Leader in charge of Administration to the O.C. Station, Kuala Lumpur, from the beginning of the operations in Malaya, he undertook with outstanding ability a very heavy load of work. His example was an inspiration to all.

DISTINGUISHED FLYING CROSS

Flying Officer IAN MAURICE PEDDER

During the last six months in Malaya he completed some 250 hours' flying. He flew fifty-six days in succession, completing sixty sorties, of which two-thirds at least were successful. This success was almost entirely due to the skill and determination of this officer. Away from his squadron and flight commander, his little detachment achieved remarkable results in very difficult circumstances.

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BRITISH EMPIRE MEDAL (MILITARY DIVISION)

532166 Flight Sergeant EDWARD CLARK, in charge of armourers.
571853 Flight Sergeant STEPHEN CHARLES LEPPARD, wireless mechanic.
574253 Sergeant RAYMOND FREDERICK GEORGE HOWARD, in charge of No. 45 Squadron servicing.
534457 Sergeant JOHN MCWALTERS, in charge of motor transport.

(All in Malaya.)

ROYAL AIR FORCE PROMOTIONS

The Air Ministry have announced the following promotions since the issue of the last number of this journal:

AIR MARSHAL TO AIR CHIEF MARSHAL

The Hon. Sir Ralph A. Cochrane, K.C.B., K.B.E., A.F.C., Air Officer Commanding-in-Chief, Flying Training Command.

Sir George C. Pirie, K.B.E., C.B., M.C., D.F.C., LL.D., Air Member of Council for Supply and Organization.

Air Chief Marshal Sir Ralph Cochrane has been Air Officer Commanding-in-Chief, Flying Training Command, since October, 1947. Before taking up this appointment he was Air Officer Commander-in-Chief, Transport Command. He was born at Cults, Aberdeenshire, on 24th February, 1895.

Air Chief Marshal Sir George Pirie, who was born at Pittenween, Fifeshire, on 28th July, 1896, has been Air Council Member for Supply and Organization since 1st September, 1948. He was formerly Inspector-General of the R.A.F. and had previously been Air Commander-in-Chief, Air Command, Far East.

NEW APPOINTMENTS

[*Photo: Air Ministry Crown Copyright Reserved*

The Reverend Leslie Wright, the new Chaplain-in-Chief from 31st March, 1949

Air Vice-Marshal F. N. Trinder, C.B.E., future Director-General of Equipment

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Air Vice-Marshal W. E. Staton, C.B., D.S.O., M.C., D.F.C., the new A.O.A., Training Command

Among new appointments made since the April number of THE ROYAL AIR FORCE QUARTERLY was issued were the following:

AIR MINISTRY

Air Vice-Marshal Thomas Cathcart Traill, C.B., O.B.E., D.F.C., as Director-General of Personnel (II).

Air Vice-Marshal Frank Noel Trinder, C.B.E., as Director-General of Equipment.

Air Commodore L. de V. Chisman, D.F.C., as Director of Technical Training.

Air Commodore A. F. Hutton, C.B.E., D.F.C., as Director of Engineering.

Air Commodore E. C. Farman, C.B.E., as Director of Equipment (B).

Reverend Leslie Wright as Chaplain-in-Chief to the R.A.F.

COMBINED OPERATIONS HEADQUARTERS

Air Commodore T. B. Prickman, C.B.E., as Director of Combined Operations (Air).

MAINTENANCE COMMAND

Air Vice-Marshal C. N. H. Bilney, C.B., C.B.E., as Air Officer in charge of Administration.

Air Commodore C. W. Gore, O.B.E., as A.O.C. No. 42 Group.

FLYING TRAINING COMMAND

Air Vice-Marshal G. G. Banting, C.B., C.B.E., as A.O.C. No. 21 Group.

TECHNICAL TRAINING COMMAND

Air Vice-Marshal W. E. Staton, C.B., D.S.O., M.C., D.F.C., as Air Officer in charge of Administration.

COASTAL COMMAND

Air Commodore J. Marson as Senior Technical Staff Officer.

R.A.F. SCHOOLS LIAISON OFFICER

Squadron Leader R. H. Steel, O.B.E., for the Lancashire and Cheshire Areas.

MEDITERRANEAN AND MIDDLE EAST COMMAND

Air Vice-Marshal W. E. Theak, C.B., C.B.E., as Air Officer in charge of Administration at Headquarters.

Air Commodore F. W. Felgate, C.B.E., as Senior Equipment Staff Officer at Headquarters.

RHODESIA

Air Commodore N. S. Allinson, C.B., has taken over command of the Rhodesian Air Training Group.

WESTERN EUROPE

Air Commodore S. U. Bufton, C.B., D.F.C., as Assistant Chief of Staff to the Commander-in-Chief, Air Forces, Western Europe.

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OUR COMMONWEALTH AIR FORCES

Royal Canadian Air Force

Air Marshal W. A. Curtis, C.B., C.B.E., D.S.C., E.D., R.C.A.F.

MESSAGE TO "THE R.A.F. QUARTERLY" FROM AIR MARSHAL W. A. CURTIS, C.B., C.B.E., D.S.C., E.D., CHIEF OF THE AIR STAFF, ROYAL CANADIAN AIR FORCE

"It is indeed a pleasure to be able to greet members of the Royal Air Force and the Commonwealth Air Forces through the medium of 'The Royal Air Force Quarterly.' It is a happy coincidence that at the time of our Silver Jubilee the 'Quarterly' is devoting a section to the Royal Canadian Air Force. In our quarter-century of service our customs, traditions and even our uniforms have followed a similar pattern to those of the R.A.F. We have served together in war and in peace, and the comradeship we have established will continue in the future. May I take this opportunity to congratulate the Editors of the 'Quarterly' on their fine work in the past and to wish them continued success in the future?"

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ROYAL CANADIAN AIR FORCE SILVER JUBILEE

The 1st of April, 1949, marked the Silver Jubilee of the R.C.A.F. The Chief of the Air Staff on that memorable occasion called upon all to remember the past with pride and to prepare for future eventualities, in the following words at the end of his Silver Jubilee message:

> *"Therefore, on this the twenty-fifth anniversary of the Royal Canadian Air Force, let us recall with pride the glorious record of the Royal Canadian Air Force during the past twenty-five years and resolve to rededicate ourselves to greater efforts in the interest of preparedness and peace in an uncertain and troubled world."*

LOOKING BACK: R.C.A.F. HISTORY

The Royal Canadian Air Force hasn't much time for sitting back and admiring its laurels: it's too busy. But on 1st April, 1949, all ranks paused for a moment to glance proudly back over a quarter of a century of service to Canada in the skies.

Since then the R.C.A.F. has gained honour for Canada, in peace and war. It has established a reputation for fighting spirit, operating efficiency and determination of purpose that is known and respected wherever men fly.

In war the R.C.A.F. looks back upon a long list of battle honours gained around the world. Forty-eight operational squadrons of the R.C.A.F. flew overseas during the Second World War, while thousands more Canadian aircrew flew with the R.A.F. At home, during the Second World War, the R.C.A.F. administered the famed British Commonwealth Air Training Plan, and operated many squadrons at home for air defence, convoy escort and anti-submarine patrols.

In peace the R.C.A.F. has also served, providing an air defence force for Canada and at the same time carrying out numerous operations of incalculable value to civil aviation and to the country generally. Photographic survey operations, mercy flights, forest fire patrols, special northern exploration flights, and testing and developing of aircraft and equipment are but a few of the Service's peace-time contributions.

Although the R.C.A.F. dates back only to 1924, Canadians had won their spurs in the air before then. J. A. D. McCurdy flew his "Silver Dart" biplane half a mile over the ice-covered surface of Baddeck Bay, Nova Scotia, on 23rd February, 1909, the initial aeroplane flight in the Dominion.

In 1914 a Canadian Aviation Corps came into being, consisting of two officers and one aircraft. One of the two pilots, Lieutenant W. F. Sharpe, was killed overseas on a training flight, the first Canadian military aviator to give his life in the war. The Corps as such vanished, but thousands of young Canadians joined the Royal Flying Corps and the Royal Naval Air Service. As in the Second World War, Canadians showed themselves well adapted to the war in the air, and such names as Bishop, Collishaw, MacLaren and Barker became household words in the Allied nations.

In all, in the First World War, about 22,000 Canadians served in the R.F.C., R.N.A.S. and R.A.F., and 1,563 gave their lives. Over 800 were decorated, three receiving the Victoria Cross.

January, 1923, saw the creation of a single Department of National Defence, including the Air Board, and plans were laid for the creation of a permanent Air Force. This permanent force, known as the Royal Canadian Air Force, came into being on 1st April, 1924. The strength of the R.C.A.F., when created, was somewhat over 300.

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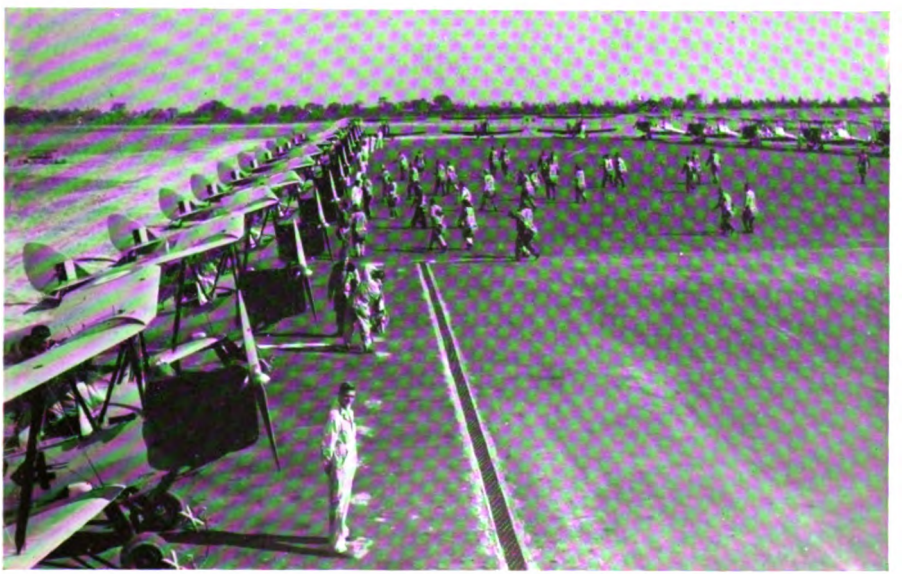
The increasing gravity of the European situation resulted in sharply increased appropriations and activity, and by 1937-38 appropriations had risen to more than 11½ million dollars. New stations were constructed, more modern aircraft were obtained, and in 1938 three Air Commands were set up—Western, Eastern and Training. In 1938, too, the R.C.A.F. for the first time became an independent Service directly under the Minister, with its own Chief of Air Staff.

On 1st September, 1939, the R.C.A.F. was placed on active service, with 4,000 officers and men, and with ten squadrons, although some were in process of formation. Another twelve, some also in formation, were listed in the Auxiliary Air Force.

The R.C.A.F., in September, 1939, was a force that merited scant attention from world strategists. Few could have foreseen that by January, 1944, it would be 215,000 strong, and a major factor in the aerial war against the enemy.

At the outbreak of the war it was realized that the majority of the permanent R.C.A.F. were needed for instructional work in the proposed British Commonwealth Air Training Plan. However, one Army co-operation squadron, No. 110 (City of Toronto) Squadron, arrived in England on 25th February, 1940, under the command of Squadron Leader W. D. Van Vliet. Four months later two more squadrons—No. 1 Canadian Fighter Squadron and No. 112 (City of Winnipeg) Squadron—arrived in the United Kingdom. No. 1 Squadron, which arrived with its own Hurricanes, took part in the Battle of Britain, under Squadron Leader E. A. McNab.

Meanwhile, the B.C.A.T.P. began operating in Canada in April, 1940, and, following the fall of France, training went into high gear. The first graduates of the B.C.A.T.P. took their place beside the veterans in 1941, and the initial trickle of R.C.A.F. men to the United Kingdom soon became a substantial and increasing flow. Canadian Fighter, Bomber and Coastal Command squadrons were organized that same year, to fly alongside the R.A.F. against the enemy. Canadian squadrons in Bomber Command increased in number until, in January,



Student pilots at a Canadian training school walking out to their Tiger Moths, to begin another day's flying

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This war-time picture shows a Canadian fighter pilot waiting orders to take off on another flight against the enemy

Canadian W.Ds. being inspected by the King during a visit to 6 Group in Yorkshire

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1943, a completely Canadian group, organized, commanded and staffed by members of the R.C.A.F., took its place against the enemy. In the first year of its operation No. 6 Group, as it was called, dropped 13,000 tons of bombs on enemy targets. During 1944 it increased the tonnage dropped to over 85,000. In fact, in that year the Canadian Bomber Group was more powerful than the entire bomber forces of the British Empire had been in 1941, and was capable of independent operations.

The Canadian fighter squadrons, that fought so magnificently over Dieppe, helped form the spearhead for the invasion by the Allies. They were merged into all-Canadian wings, and rolled up a terrific record.

Canadian Coastal Command squadrons were continually harassing enemy shipping in the North Sea as well as flying out of bases in Canada, Newfoundland, Iceland and Northern Ireland, on convoy patrols and anti-submarine activities. Other coastal squadrons operated over the Bay of Biscay, and the far reaches of the Indian Ocean.

In addition, R.C.A.F. personnel were flying with almost every R.A.F. squadron. In the defence of Malta, R.C.A.F. fighter pilot strength never fell below 25 per cent. of the total number of pilots. Canadians flew in Russia in 1941, and with the Desert Air Force from the Nile to the Po. They brought Allied agents into the heart of enemy territory, and flew supplies to the relief of Warsaw. They dropped bombs on the *Tirpitz* and flew with Gibson on the Mohne Dam attack. They fought over the jungles of Burma and the mountains of Greece. Canada may have gone into the war with pinfeathers, but before it was over her wings covered the globe.

Canada's women took their place beside their men, and the R.C.A.F. Women's Division has a proud record.

Canada's contribution through the famed B.C.A.T.P. must be regarded as a major factor in itself. Organized and operated by the R.C.A.F., the training plan produced more than 131,000 trained aircrew for the air forces of the Commonwealth, over half of them Canadians. It terminated on 31st March, 1945.

More than 8,600 decorations and medals were awarded to R.C.A.F. members in the Second World War, and two members—Flight Lieutenant David Hornell and Pilot Officer Andrew Mynarski—won the Victoria Cross. Each gave his life in the action that won him the award. Four other members of the force won the coveted George Cross. The R.C.A.F. set a high standard during the Second World War, a difficult one for men of the post-war force to maintain, but it will be maintained.

[*"Today's R.C.A.F." will be published in the October number of "The R.A.F. Quarterly."*—ED.]

SOLID SERVICE FOR SILVER ANNIVERSARY

Five R.C.A.F. men can look back today over a quarter of a century of unbroken service to 1st April, 1924, the birthday of Canada's present Air Force.

The five who were among the slightly more than 300 who made up the original "few" and saw it grow in stature to a war-time strength of over 215,000 are: Air Vice-Marshal K. M. Guthrie, C.B., C.B.E., retiring head of North-West Air Command, Edmonton; Air Vice-Marshal C. R. Slemon, C.B., C.B.E., Air Member for Operations and Training, Ottawa; Air Commodore D. E. MacKell, C.B.E., Deputy Air Member for Personnel, Ottawa; Group Captain A. O. Adams, O.B.E., Officer in charge of Logistic Planning, Ottawa; and Wing Commander A. H. Warner, Staff Engineering Officer, N.W.A.C., Edmonton.

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Royal Australian Air Force

Air Marshal G. Jones, C.B., C.B.E., D.F.C.,
Chief of Air Staff, Royal Australian Air Force

The Post-war Royal Australian Air Force

By Air Marshal G. Jones, C.B., C.B.E., D.F.C.
Chief of the Air Staff, R.A.A.F.

The following has been written exclusively for "The Royal Air Force Quarterly and Commonwealth Air Forces Journal" by Air Marshal G. Jones, C.B., C.B.E., D.F.C., Chief of the Air Staff, Royal Australian Air Force

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AT the conclusion of the Second World War the Royal Australian Air Force, as with other British Commonwealth armed services, faced the problem of reconverting to a smaller, efficient, peace-time organization. Though the ideals for the post-war Service were readily perceivable, there were many practical difficulties during this transition period. Financial limitations and difficulties of attracting adequate man power and the necessity for higher standards of training in peace time made it essential to plan carefully and in great detail, in order to keep the Force balanced, highly trained, well equipped and up to date in aircraft and other Air Force developments. Though some of these difficulties have not yet been fully overcome, mainly due to certain shortages of man power and to continued increases in costs and wages, the basis for a highly efficient organization has been laid so that the Air Force will be capable of rapid expansion in the event of war and able not only to meet the defence requirements of Australia but to contribute a maximum effort towards British Commonwealth defence.

DEMOBILIZATION OF WAR-TIME PERSONNEL

The strength of the R.A.A.F. on 1st October, 1945, was 152,000. Other than volunteers for deferred demobilization, discharges were to be effected within twelve months. Various systems for demobilization were considered and it was decided to allot priorities for demobilization on a points system based on personal considerations and on the war service of each member.

POST-WAR RECRUITING

Many phases of R.A.A.F. activities have been seriously hampered by inadequate response to strong recruiting drives. Applications for aircrew training and for the apprenticeship scheme have been very satisfactory, but deficiencies are most noticeable in respect of adult personnel for ground staff, especially personnel with the aptitude for the higher technical musterings, such as fitters, radio and radar mechanics, instrument makers and electricians.

The main reason for the shortage of suitable recruits is the intense competition by private industry and civil aviation. Lack of accommodation and of amenities for married personnel on, or near, R.A.A.F. stations also hinders the recruiting campaign. Nevertheless, the intake of new recruits exceeds the number of outgoing personnel, and it is now anticipated that the target will be achieved.

TRAINING PROGRAMME

The R.A.A.F. has embarked on an extensive five-year training programme to build up a very highly trained force.

An Australian youth has the opportunity to enlist in the Air Force as an air cadet at the R.A.A.F. College, as an aircrew trainee at a Flying Training School, as an aircraft apprentice at the Ground Training School, or as a radio apprentice at the Radio School. He also has the choice of direct entry to varied trades or occupations which may suit his particular capabilities.

The R.A.A.F. College and the apprentice scheme have been in existence for only one year, but the volume of applications and the enthusiasm displayed by the successful candidates in their first year of training augur well for the success of these two schemes.

Advanced training also plays a major part in bringing personnel to the peak of efficiency. The School of Air Navigation, which began operations in 1946, is a typical example of this type of training. Revolutionary developments in aviation since the end of the war are greatly increasing the speed of aircraft and the ranges

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of some types have also been increased. Navigational research and training provide the key to many aspects of the planning of future air warfare; the Air Navigation School is the R.A.A.F.'s University of Navigation, and its motto is "Wisdom Through Diligence."

The other major advanced training and research units which are fully established are the Air Armament School, the Aircraft Research and Development Unit, the School of Land Air Warfare and the Aviation Medicine Research Section. Each of these units studies modern developments and Air Force equipment for the purpose of improving the present efficiency and future development of the Air Force.

Closely allied with the Permanent Air Force are the Active Citizen Air Force, the Citizen Air Force Reserve and the Permanent Air Force Reserve. Personnel of the C.A.F. have an annual training commitment of fifty-two days, and reservists are kept in touch with the latest developments by means of special training bulletins, Service pamphlets, news-letters, lectures, films and, wherever possible, visits to R.A.A.F. stations and units for the purpose of studying new equipment and techniques.

OPERATIONAL FUNCTIONS

Although active flying has been greatly reduced since the cessation of hostilities, essential functions and operational training have all been effectively maintained. These include the provision of an air component with the occupation force in Japan, transport duties to Japan and within Australia and the Mandated Territories, participation in the Berlin air-lift, mobility exercises by operational wings, long-range navigational exercises, air-sea rescue duties, bush-fire patrols, destruction of insect pests by aerial spraying and photographic survey of large areas of Australia.

The contingent in Japan has been the most active; it consisted of a very strong Fighter Wing, with three flying squadrons and its own Base Squadron, Maintenance Squadron and Mobile Fighter Control Unit, together with an Airfield Construction Squadron. On completion of their duty in Japan these units will be dovetailed into the R.A.A.F. organization in Australia.

R.A.A.F. transport squadrons have flown intensively since the war on varied duties with an outstanding record of safety and efficiency. Equipped with Dakotas, they maintained for two years the long air route from South-Eastern Australia to Japan, without the loss of a single aircraft. Since the transfer of this courier service to civil aircraft under charter to the R.A.A.F., their activities have been mainly concentrated on air-transport duties within Australia and the adjacent islands. Since August, 1948, however, ten complete Dakota crews have been provided in Europe to assist in the Berlin air-lift.

Several air mobility exercises have been carried out, and recently a detachment of Lincoln aircraft, complete with ground staff, supplies and operational spares, moved to an advanced aerodrome, 2,000 miles from their base, for the purpose of staging exercises to test the mobility and operational efficiency of the bomber wing. The operational exercises from the advanced base included long-range attacks on sea and land targets, and search and navigational exercises. Dakotas of the Transport Wing carried out the task of the movement of supplies and equipment required to the advanced base throughout the exercise, which was conducted under war-time living and operating conditions.

Long-range navigational exercises under all weather conditions are carried out continuously to keep squadron personnel trained in navigation and flight planning and organization.

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The R.A.A.F. air-sea rescue organization maintains a small but efficient service over the main air routes of the vast Australian continent and adjacent islands; Catalinas and 48-foot launches are employed on these air-search and sea-rescue functions.

Bush-fire patrolling and aerial spraying are carried out to assist the civil authorities.

Since the war Australian-built Mosquitoes have photographed a million square miles of Australian territory for survey purposes. Experience gained from war-time P.R.U. work has proved invaluable in this task.

FINANCIAL ASPECTS

The Government has approved of an all-Services expenditure amounting to £250,000,000 extending over five years. Of this sum, the Air Force allotment is £62,500,000 at an annual rate of £12,500,000.

In addition, an annual allotment of £6,700,000 for the five years has been allocated for research and development, a proportion of which will be used for Air Force aspects.

PLANNED STRENGTH

Except for one general reconnaissance bomber squadron which will be formed during 1949-50, all units planned for the Permanent Air Force, comprising sixteen operational squadrons and ancillary units, have already been formed, and are practically all at their planned permanent locations. All bomber squadrons are armed with Lincoln aircraft from local production. All fighter squadrons are equipped with Mustangs, which are also produced in Australia, and re-equipment with modern jet fighters built in Australia will be commenced shortly.

Large reserves of operational and training types of aircraft are held in storage for use when required.

The personnel strength of the R.A.A.F. to be achieved by the end of the five-year plan is 13,092. The strength at the end of the first year was 8,012, as compared with a pre-war strength of 3,500.

The strength of the Citizen Air Force to be achieved under the programme is 400. The four Citizen Air Force squadrons have been formed, and are operating Mustang and training aircraft with Permanent and Citizen Air Force personnel.

AIRCRAFT INDUSTRY

To comply with the British Commonwealth's requirement for a dispersed aircraft industry, the Australian Government and private industries have maintained for the future a framework of the efficient aircraft production establishments which developed so rapidly during the Second World War.

Approved plans to set up manufacturing and assembly plants throughout Australia for the motor and other trades will also provide readily convertible centres for the production of aircraft should the need occur in any future conflict.

Production today includes bombers, fighters, transports and trainers, including jet types, efficient enough to serve the interim needs of the R.A.A.F. More modern aircraft of proved strategical value and performance will be built as the modernization programme progresses.

The industry has, in the past, provided a number of aircraft of original design, two of which were accepted and put into service. A new civil feeder transport of Australian production will also take its place shortly in airline service, and it can be expected that other prototypes will make their first flight in Australian skies in the future.

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FUTURE AIMS

The role of the post-war Air Force harmonizes with that of the Navy and Army. From its contemplated and potential strength it will assist Australia in fulfilling her obligations under the United Nations Charter, including regional arrangements in the Pacific. It will enable participation in arrangements for co-operation in British Commonwealth defence, provide a basis for expansion in war, and will furnish the air contribution to the requirements for the local defence of Australia.

The attainment of these aims depends on the performance, efficiency of aircraft and equipment, the skill and morale of personnel, and the ability to replace losses of aircraft and personnel. In this regard, the following six factors are considered essential:

(*a*) A force of highly trained and organized Permanent personnel as large as practicable within the financial limitations of the nation.

(*b*) An aircraft industry capable of producing our requirements in peace, and of expanding to meet our requirements in war. This must include adequate provision for research and development.

(*c*) Full-scale unit equipment and reserves of the highest performance and most up-to-date aircraft to meet an emergency and for training purposes.

(*d*) The development and retention of the techniques of war by constant practice and exercises.

(*e*) An adequate reserve of trained personnel which includes the Citizen Air Force and suitable men employed in civil aviation and industry.

(*f*) The organization and establishment of training and maintenance facilities to back up such a force.

It can be realized from the foregoing that the Royal Australian Air Force, although experiencing the post-war difficulties common to the armed Services of all democratic countries, is implementing a programme which will ensure the maintenance of an efficient Air Force—an Air Force capable of taking its place alongside other members of the British Commonwealth of Nations and of making an effective contribution in any future war.

The Editor invites readers to submit articles for consideration for publication in this journal. Payment will be according to the quality and length of the contributions accepted for publication.

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Royal New Zealand Air Force

Air Vice-Marshal A. de T. Nevill, C.B., C.B.E., B.Sc., A.F.R.Ae.S., Chief of Air Staff, Royal New Zealand Air Force

MESSAGE TO "THE ROYAL AIR FORCE QUARTERLY" FROM AIR VICE-MARSHAL A. de T. NEVILL, C.B., C.B.E., CHIEF OF THE AIR STAFF, ROYAL NEW ZEALAND AIR FORCE

" 'The R.A.F. Quarterly,' as the premier Air Force journal in the Commonwealth, plays an important part in moulding Service opinion. I welcome the intention to give still more publicity to the Commonwealth Air Forces.

"New Zealand received its first military aeroplane in 1913, presented by the Imperial Air Fleet Committee of Great Britain. The aeroplane was aptly named 'Britannia' and, whilst somewhat of an embarrassment to the Army during its

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short life, the spirit of that gift has endured and the objects of the Committee, which appeared quite visionary at the time, are steadily approaching fulfilment.

"Today the responsibility of maintaining the 'Pax Britannica'—more truly the 'Pax Democratica'—has devolved, in a large measure, upon the air forces of the United States and the British Commonwealth. They should be capable of acting in complete harmony in war. It is taken for granted, perhaps too readily, that the various elements of the Empire Air Forces can do so without adjustments on the outbreak of war. This can be assured beyond doubt only by collective training in peace, and the stage is now set for such training.

"The range of modern aircraft, coupled with freedom of movement throughout the Commonwealth, makes it possible to maintain today common standards in training, equipment and tactical doctrines and to inculcate a real team spirit. The exchange of Service units and personnel throughout the British Commonwealth should become commonplace. Our playground is the whole Commonwealth, over which we can now move 'under our own steam.'

"With this outlook our Air Forces will become to an increasing degree one of the most important links in the unity and strength of the British Commonwealth, both in peace and in war. With this outlook the 'Commonwealth Air Forces Journal' is already inspired."

BIOGRAPHY OF AIR VICE-MARSHAL A. de T. NEVILL, C.B., C.B.E., B.Sc., A.F.R.Ae.S., p.s.a.

BY SQUADRON LEADER J. M. S. ROSS, R.N.Z.A.F.

Born 1899. Educated Auckland Grammar School and Victoria University College, Wellington. Cadet, Royal Military College of Australia, Duntroon, 1916-19. Posted to Royal New Zealand Artillery, 1919, and was on active service on the North-West Frontier 1919-20. Returned to New Zealand in 1921 and served in various staff and regimental appointments for the next ten years. Transferred to the New Zealand Permanent Air Force in 1930, in the rank of flight lieutenant, and appointed Staff Officer to the Director of Air Services. Posted to Hobsonville (Auckland) for general duties 1931-32, and then returned to his previous appointment. Posted to Air Ministry in 1934 as New Zealand Liaison Officer. Passed R.A.F. Staff College, Andover, 1935, and was then attached to the R.A.F. Returned to New Zealand 1936 and appointed Chief Staff Officer to Director of Air Services. Promoted squadron leader 1937 and later the same year appointed Air Force Member for Supply, being the first to fill the post on the establishment of the Air Board. Promoted wing commander 1938 and group captain 1940. Honorary A.D.C. to His Excellency The Governor-General 1940. Promoted acting air commodore 1942 and appointed A.O.C., R.N.Z.A.F. Headquarters, London. Attached to Coastal Command during 1943. Returned to New Zealand in December, 1943, appointed Vice-Chief of the Air Staff. Appointed Chief of the Air Staff in the rank of air vice-marshal, May, 1946. Awarded Legion of Merit (Degree of Officer), United States, 1948. President of the New Zealand Division of the Royal Aeronautical Society. Is the first New Zealand born officer to hold the position of Chief of the Air Staff.

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POST-WAR LEGISLATION AND THE ROYAL NEW ZEALAND AIR FORCE

Two principal statutes affecting the Air Force have been passed by the New Zealand Government since the end of the war. The Superannuation Act, 1947, deals with the superannuation of public servants. Part III of the Act refers to members of the Armed Forces. It provides that all permanent members of the Forces—i.e., those who are serving on regular engagements of two years or more—shall contribute to a superannuation fund. Those who previously served without paying contributions, including all those who enlisted for the duration of the war, and who have since accepted regular engagements, are permitted to buy back their past service and count it towards the twenty years necessary to qualify for a retiring allowance.

The Air Force Amendment Act, 1947, amends the Air Force Act, 1937, under which the Royal New Zealand Air Force was originally constituted. The main provisions deal with the establishment of the W.A.A.F. and the Air Training Corps as integral parts of the Service. The Act also contains a clause which permits the Minister of Defence to authorize the Air Force to operate aircraft for hire or reward when he considers it is in the public interest to do so.

ORGANIZATION AND ADMINISTRATION OF THE ROYAL NEW ZEALAND AIR FORCE

By Squadron Leader J. M. S. Ross
Historical Records Officer

Development to the End of the War

The history of the Royal New Zealand Air Force as it is now constituted extends over only twelve years. From 1922, when an "Aviation Corps" was first established on a very modest scale, until 1937 the Air Force was administered with the Army by the Defence Department and was dependent on the Army for most of its services. In 1936 Wing Commander The Hon. R. A. Cochrane,* A.F.C., R.A.F., was sent to New Zealand to advise the Government on the country's air-defence needs. As a result of his recommendations the R.N.Z.A.F. was divorced from Army control and constituted as a separate branch of the Fighting Forces administered by a new Department of State, the Air Department.

The Air Department was modelled on the lines of the Air Ministry and was intended to serve as a framework which could be added to as the occasion arose. To control policy and to advise the Minister of Defence on Air Force matters an Air Board was established, presided over by the Minister and consisting of the Chief of the Air Staff, the Air Force Member for Supply, the Air Force Member for Personnel and the Air Secretary. A Civil Aviation Branch was formed within the Department and when matters involving the co-ordination of civil and Service flying were under discussion the Controller of Civil Aviation sat as a member of the Air Board. Except for a period during the war, when a Vice-Chief of Air Staff was appointed and sat on the Board, its constitution has remained unchanged up to the present.

*Air Chief Marshal The Hon. Sir Ralph Cochrane, K.C.B., K.B.E., A.F.C.

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When war broke out in 1939 the Air Force Headquarters organization consisted of C.A.S.'s staff, which included Air 1, responsible for operations and operational training, Air 2, responsible for intelligence and security, and staff officers responsible for flying, navigation, technical, signals and armament training; A.M.P.'s staff, which consisted of three personnel staff officers; A.M.S.'s staff, which comprised senior engineering, maintenance and equipment officers, four junior equipment officers and a works officer; and the Air Secretary's staff, which controlled the accounts section and all civilian clerks.

Most of the senior staff posts were filled by R.A.F. officers on loan, since the R.N.Z.A.F., still in its infancy, possessed only a small nucleus of regular officers, very few of whom had had any administrative experience. The practice of filling a number of senior posts with R.A.F. officers still continues and the experience which they bring to their work is of infinite benefit to the R.N.Z.A.F. In the rapid expansion following the outbreak of war—the Service had increased tenfold by the end of 1940—the supply of senior officers was augmented by the appointment of retired R.A.F. officers living in New Zealand, and of civilians with previous Service experience who were particularly suitable for senior administrative posts. Junior posts were, for the most part, filled by men appointed from civilian life and given some brief training in Service procedure.

In the first four years of the war the Air Force Headquarters, like Topsy, "just growed." The fact that it did so with great rapidity, under the pressure of war and with insufficient trained staff, resulted in a certain lack of planning and co-ordination. Looking back, it is easy to see the faults which existed in the organization, but taking into account the circumstances of the time it is difficult to see how anything much better could have been expected. In any case, things were probably no more chaotic than in many another headquarters.

As the size and responsibilities of the R.N.Z.A.F. grew, the various sections of Air Headquarters expanded into directorates, again following more or less the pattern of the Air Ministry. In 1942 an extensive reorganization took place. Until then the R.N.Z.A.F. had been concerned almost entirely with implementing New Zealand's policy with regard to the British Commonwealth Air Training Plan, and the administrative system which had developed was moderately well able to cope with its task. The spread of the war to the Pacific and the subsequent necessity to prepare for New Zealand's defence against invasion imposed a substantial operational commitment on what had virtually been purely a training organization. The most significant changes were the removal of the Directorate of Flying Training from the C.A.S.'s staff, which was overburdened with operational responsibilities, and its amalgamation with Technical Training under a Director of Training on the staff of the A.M.P.; and the formation on the C.A.S.'s staff of a Directorate of Organization and Staff Duties in an attempt to rationalize establishments and organization.

The R.N.Z.A.F. reached its peak strength in 1944, at which time also the Headquarters achieved its maximum size and complexity. A fair criticism which may be made at this stage is that the organization had grown top-heavy and unwieldy, and that the shortage of experienced staff officers at all levels had resulted in the inability of a number of directorates to cope efficiently with their work.

Throughout 1945, as the end of the war approached and the commitments of the R.N.Z.A.F. gradually decreased, it was possible, by amalgamating some directorates and abolishing others, to streamline the Headquarters organization somewhat and, with the experience of the past six years, to increase the efficiency of its working.

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A handicap from which the R.N.Z.A.F. suffered throughout the war was that no provision had been made when the Service was first established for the institution of intermediate formations between the Air Headquarters and individual stations. In 1937 there had been no necessity for them, for only two stations were then in existence and two more planned, while the total proposed personnel strength was under 2,000. When, during the war, the Service maintained in New Zealand and the South Pacific a total of over forty stations with a maximum personnel of over 40,000, the Headquarters organization was swamped with a mass of administrative detail which should have been the responsibility of intermediate formations. A group organization was formed in 1942, consisting of Northern, Central and Southern Groups in New Zealand and No. 1 Islands Group in the Pacific, but only the last, by reason of its distance from Headquarters, was able to carry out its functions satisfactorily. The others were delegated little or no authority. They were established as an emergency measure, when New Zealand was thought to be in danger of invasion, since it was recognized that for operations decentralization of command was essential. As New Zealand was never invaded, their operational value was not tested. As administrative units they did not prove their worth. The practice of centralized control was firmly established—it is a national characteristic of New Zealand to delegate as little authority as possible—and in many matters Headquarters continued to deal direct with stations. They were abolished before the end of the war.

Post-War Organization

Two factors have governed the planning of the post-war Air Force. The size of the Service is limited by the willingness of the taxpayer to support it in peace time; and within that limit it must develop an organization which can quickly and efficiently be expanded when the need arises. The lessons of the war period have been noted, and the R.N.Z.A.F. is in the process of being reorganized at all levels to fit it for modern requirements. The desirability of standardizing the Commonwealth air forces as much as possible is recognized, and current R.A.F. administrative practice is being followed in as far as it is applicable to New Zealand conditions.

There are at present three flying stations in New Zealand and one in Fiji, as well as stores, repair and assembly depots. The proposed peace-time establishment, which has not yet been achieved, is 4,150 personnel. It will be used to man one fighter, one transport, one flying-boat, and two long-range bomber reconnaissance squadrons, together with ancillary engineering, equipment and training units.

In addition to the regular Air Force there are non-regular forces which, when fully established, will be capable of providing annual training for some 4,000 men. A Territorial Air Force is in the process of formation, with squadrons in each of the four main towns. It will consist of a small core of permanent personnel, who will be responsible for training members at evening and week-end parades and in annual camps. Its recruits are expected to come mainly from the Air Training Corps of 5,000 cadets which, with units in most towns and secondary schools, has been functioning for the past eight years and has recently been established as an integral part of the R.N.Z.A.F. An Active Reserve is also being formed, consisting of ex-Service men who, while not parading in the evenings and week-ends, will receive a certain amount of training at annual camps.

The chief changes in the Headquarters organization since the end of the war, apart from a general and considerable scaling down of staffs and the consolidation of the functions of directorates, have been the formation of Directorates of

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Technical Services and Reserves, and the grouping of flying training, navigation and operations under a Director of Operations and Flying Training. D.T.S. includes two Deputy Directorates, of Engineering and Technical Training. The Director of Signals and Staff Officer, Armament, are both responsible to it in technical and training matters. In establishing it the R.N.Z.A.F. has gone part of the way in the footsteps of the R.A.F. in recognizing the increased importance of technical services and training and the necessity for placing them all under one head.

The immediate commitment of the Directorate of Reserves is the establishment of the Territorial Air Force and the Reserve and the direction of the Air Training Corps. Ultimately its function will be the inspection and co-ordination of administration of all the non-regular forces.

On stations, the three-wing system of administration introduced by the R.A.F. has been adopted and is undergoing a trial, the wings being designated Flying, Technical and Administrative. It has been objected that the average New Zealand station, with a population of about 500, is too small to justify such an organization, and present staff shortages are responsible for the wings not being fully established. This objection appears to be outweighed by the advantages of the scheme, which shows promise of working well. In addition, a fourth wing has been established on each of the three major stations in New Zealand, to administer the non-regular units in their respective areas.

A considerable amount of study has been given to the establishment of intermediate formations between the Air Headquarters and stations. Obviously, in a Service whose total strength is no more than that of two good-sized R.A.F. stations, there is no room for an elaborate system of commands and groups. On the other hand, it is recognized that a certain amount of decentralization of administration will enable the Air Force to maintain a higher degree of efficiency primarily by divorcing policy from detailed administration at the appropriate level, besides providing an essential training ground for junior staff officers. Policy in the matter has not been finally decided, but present proposals are to form two groups on a functional basis. Southern Group, with headquarters at Christchurch, is to be responsible for all training activities, which will mostly be located in the South Island. Northern Group, with headquarters at Auckland, will include Fiji and North Island stations, and will be responsible for the control of operational squadrons and operational training. The groups will command and administer all non-regular forces in their respective areas through the parent stations to which the units are attached. Stores and repair depots will be linked by a direct chain of command, as at present, with Air Headquarters on all technical matters.

If the organization outlined is put into force and is fully established it should provide a reasonably compact and flexible Service capable of fulfilling its peacetime commitments and providing a basis for orderly expansion in event of war.

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EDITOR'S NOTES

AN EXPRESSION OF GRATITUDE

ENCOURAGEMENT and practical help in the difficult task of producing this new issue have come from every quarter and we wish to express our gratitude through these columns to Marshal of the Royal Air Force The Lord Tedder, G.C.B., D.C.L., LL.D. (C.A.S. of the R.A.F.), Air Chief Marshal Sir John C. Slessor, G.C.B., D.S.O., M.C. (Commandant of the Imperial College of Defence), Air Marshal W. A. Curtis, C.B., C.B.E., D.S.C., E.D. (C.A.S. of the R.C.A.F.), Air Marshal G. Jones, C.B., C.B.E., D.F.C. (C.A.S. of the R.A.A.F.), Air Marshal Sir A. B. Ellwood, K.C.B., D.S.C. (C.-in-C., Bomber Command), Air Vice-Marshal S. C. Strafford, C.B., C.B.E., D.F.C. (S.A.S.O., Bomber Command), Air Commodore L. T. Pankhurst, C.B.E. (Director of Command and Staff Training), Wing Commander E. B. Beauman (ret.) (Directorate of Staff Training), Wing Commander J. R. Gordon-Finlayson, D.S.O., D.F.C. (Joint Services Staff College), Colonel William B. Kieffer (Assistant Air Attaché, American Embassy), Squadron Leader J. M. R. Ross (Historical Records Officer, R.N.Z.A.F.), Squadron Leader U. H. Mignon (Editor of *The Roundel*, R.C.A.F.), Charles D. Frazer (National Air Council, U.S.A.), Mr. J. C. Nerney (Air Historical Branch, Air Ministry), Mr. R. V. Dodds (Director of Public Relations, R.C.A.F.), Mr. E. R. A. Wilson (Information Division, Air Ministry), and contributors, past and present, for their continued loyal support.

The helpful and friendly co-operation received has been a source of great encouragement and the Editor is most grateful.

THE NEW ISSUE

The change in the format of this journal and the introduction of new features in the contents are no new idea. For one so inexperienced in his duties, your new Editor considered it advisable to serve a year's apprenticeship before venturing to make any considerable change in the long-established lay-out of THE ROYAL AIR FORCE QUARTERLY which, on taking over the editorship a year ago, seemed desirable. An outline of some of the changes proposed was given in "Editor's Notes" of his first issue (October, 1948), which are republished below for easy reference:

The aim of the Editor is to dwell less on the achievements of the past (except those influencing tradition) and more on what is taking place in the world today, and to publish articles that will stimulate helpful discussion in the future.

He will endeavour to obtain more contributions concerning the Dominion Air Forces and, if sufficient material is received, a complete section of the journal will be devoted to this purpose.

It is proposed to introduce new features of general interest, such as a permanent Sports Page, in which will be reported selected sports activities of special interest, such as inter-Service contests, international events in which R.A.F. personnel or those of the Dominion Air Forces take part, etc. In addition, "matters concerning personnel" will be introduced, giving particulars of new appointments, promotions, honours, retirements, etc.

If a suitable biographer can be found, a series of biographies of well-known airmen will also be included.

Another series the Editor hopes to introduce is one dealing with the everyday life on various stations of the Air Forces at home and abroad.

Not only has this policy now been fully implemented but additional features of

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interest have been introduced, such as "Lists of New Books of an Air Force Interest," "Lists of Articles of Air Force Interest in Current Journals," "Air Force Affairs in Parliament" and a "Correspondence Column."

Now we come to the "new look" of this journal, and we approach this subject with feelings of *faith*, *hope* and the need for a little *charity* from some of our older readers. We have faith in the reasons which decided us to make the change, hope that the reasons will be amply justified, and that those who are averse to changing old-established customs for new ones will be charitable in their criticisms of the "new look."

It may not be realized that, although the other Services have numerous journals to choose from, this is the only one of its kind in the Royal Air Force, and we were astounded, on taking over the editorship, at the limited circulation of your QUARTERLY. The basic motive behind the change in format and contents is to increase the number of copies issued. Expert advice was sought and the opinion given was that for a wide circulation the cover was "dated" and should be made more modern. The size has been reduced, and the quality of the paper improved, in Air Force terms, to give more *flexibility* to the contents (in that pictures can now be inset into the text) and, being now pocket-size, to give it greater *mobility*.

The price has been reduced from 6s. per copy to 3s. 6d., to bring it within financial reach of all.

The publishers have generously made available a large sum of money for a campaign to give this new issue wide publicity. It remains for all those interested in our Air Forces to rally round and give their only journal the support it merits. We sincerely hope that our circulation will increase and, to encourage serious reading in all quarters, that copies will be ordered for every officers' mess, sergeants' mess and airmen's reading room on every station in the United Kingdom, our Dominions and overseas.

THE PURPOSE OF "THE R.A.F. QUARTERLY"

The usefulness of the QUARTERLY to our Air Forces hardly needs stressing, as it must be obvious that the high standard of its contents must advance professional study of air matters. It provides a forum in which ideas can be put forward on air matters and in particular on general matters of war as seen through the eyes of personnel of our Air Forces. Authors, by putting forward their own views in articles in this journal, provide useful ground for discussion in the correspondence columns of THE ROYAL AIR FORCE QUARTERLY. In any gathering where conversation turns on "shop," there are usually as many opinions as there are men present, and every article on a professional subject must arouse a measure of disagreement in some readers. There is no limit to the extent to which such discussions might benefit not only our Air Forces but our Empire Defence Forces.

It is for this reason that we sincerely hope that it will also have a wide circulation in the Navy and Army.

For the thousands of ex-Air Force personnel it provides a journal of interest and keeps them well informed on Air Force matters of today and future developments. For the general public there is no better source of information for those who are interested in the affairs of the first line of defence of their country.

AIR FORCE BENEVOLENT FUNDS

It is interesting to note that over a thousand pounds has now been contributed by this journal to the benevolent funds of our Air Forces.

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CURRENT EVENTS

UNITED KINGDOM

IN comparison with the Navy and Army, the brief life of our first line of defence was made apparent at the reunion of the R.F.C. and R.N.A.S. at Londonderry House on the thirty-first anniversary of the formation of the Royal Air Force. Here could be seen living representatives of our Air Force from its birth to the present day. Officers and men of the old Air Battalion, Royal Engineers, which formed the nucleus of the military wing on its formation in 1912 were present, as was the most recently commissioned officer to the R.A.F. (the latter as a special guest).

Yet despite this short life no Service has finer traditions than those built up in so short a time by the past and present members of our air arm.

These survivors of "the bow and arrow age" of flying were the representatives of a far greater multitude, and to them both the present Royal Air Force owes a great debt. These were the founders of the finest air force that the world has ever seen, which rose to great heights of achievement in the Battle of Britain, the defence of Malta, the mass bombardment of Germany and on many other occasions, and whether these were individual achievements or those of large formations, they were all made possible by the teamwork of the R.F.C., the R.N.A.S. and the R.A.F.

The seven hundred present and the four hundred who applied to attend but could not be accommodated (from lack of space) must have read with interest the accounts of their reunion in the Press, as the somewhat overcrowded rooms made it impossible for individuals to gather all that transpired during the evening. Another time we suggest that a large hall, with adequate small tables to accommodate everyone, should be chosen and the occasion made one for a dinner in lieu of a cocktail party (the Ministry of Food permitting).

Although many old friends were somewhat disguised by age (and more comfortable figures), the excellent idea of wearing a lapel badge with one's name on removed the difficulty of recognition. However ancient in years were those who "reminisced" together, in them was still the spirit of youth, which in the past had led them off on what was then the great adventure of flying. It was this spirit that led to the birth of the R.F.C. and R.N.A.S. and which, coupled with endeavour, will enable today's Royal Air Force to maintain the traditions built up by so much sacrifice by those whom this reunion represented.

We congratulate the organizers of this memorable reunion, and all those present owe a debt of gratitude to them for the very pleasant evening. An excellent suggestion was put forward in *The Aeroplane* that a similar or larger reunion should be held on the eve of the next R.A.F. Display, with which we heartily agree.

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This year's annual R.A.F. Staff Exercise held by the Chief of the Air Staff, Marshal of the Royal Air Force The Lord Tedder was a conference on man power. It was asked to discuss how the needs of the R.A.F. could best be fitted into the national requirement for skilled man power in the light of the limited resources available.

Some 200 representatives from civil life were invited to the conference to discuss the subject with a similar number of senior R.A.F. officers. Representatives of the other two Services were also invited.

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It was not the function of the conference to arrive at conclusions regarding future policy, but to make possible a frank and confidential exchange of ideas on a problem which has become increasingly important with a policy of full employment and the need to make the most economical use of the nation's limited manpower resources.

An exhibition was staged in conjunction with the conference to show pictorially to the civilian representatives why the R.A.F. demands such a high degree of quality and skill. It also provided a guide to the work and training of the various trades.

The officer responsible for organizing the conference was Air Chief Marshal The Hon. Sir Ralph Cochrane, Air Officer Commanding-in-Chief, Flying Training Command.

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It is now officially stated that, as the outcome of extensive trials by the Royal Air Force, the De Havilland Chipmunk basic trainer has been selected to replace the Tiger Moth at all reserve flying schools. It will thus become the standard aircraft for pilot training in the Royal Air Force Volunteer Reserve, and many hundreds of the type will be entering the Service during the next few years.

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The British Navy will shortly receive its first British-built helicopter—a Westland Sikorsky S-51. More will follow. The Royal Navy has had extensive experience with American-built S-51's. So, too, has the helicopter unit of British European Airways Corporation, which, after mail-carrying experiments by day in an area of England where surface communications are bad, is now engaged in carrying mail by night.

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Flights up to 44,000 feet—approximately eight miles—are soon to be undertaken by the Tudor 8 four-jet experimental air liner which, after thirty hours of preliminary flying, is now being fitted with a pressurization system designed to meet the heavy demands which will be made upon it in the course of these high-altitude trials. Hitherto the Tudor 8 has not flown above 20,000 feet.

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Gliding training for members of the Air Training Corps showed a marked increase in 1948 over the previous year. The total number of glider launches during 1947 was 121,561. The total in 1948 was 150,998. There was also a marked increase in the number of A.T.C. members who qualified as glider pilots up to the Royal Aero Club's "A" certificate standard. The figures for these were: 1947, 1,453; 1948, 2,127—an increase of over 30 per cent.

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Members of the R.A.F. Escaping Society attended their third post-war reunion on 30th April. Air Marshal Sir Basil Embry, the new Air Officer Commanding-in-Chief, Fighter Command, who is himself an escaper, presided at this meeting.

The Society was founded by Marshal of the Royal Air Force Viscount Portal of Hungerford in the summer of 1945. Members total 530, of whom more than 100 live overseas.

Some 5,000 men and women of the "underground" who helped the escapers through enemy-occupied territory have been made honorary members of the Society, which claims to be the most exclusive organization of its kind in the world, since only those who escaped successfully are admitted to full membership. Members include Air Commodore Whitney Straight, His Highness Prince Werner de Merode, of Belgium, and Eric Williams, M.C., author of *The Wooden Horse*.

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The Society works with charitable institutions set up in ex-occupied countries to help dependants of men and women who lost their lives while helping its members to escape. It arranges reciprocal visits and reunions between escapers and helpers, assisting the latter with their fares.

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Eight bells was rung at R.A.F. College, Cranwell, when Commodore R. St. V. Sherbrooke, the Russian convoy V.C., presented a mounted warship's bell to the College on behalf of H.M.S. *Daedalus*, now the Naval Air Headquarters and Air Station at Lee-on-Solent, which he commands. On the site of the College H.M.S. *Daedalus* was housed during the 1914-18 war.

Commodore Sherbrooke, accompanied by the Commandant of the College, Air Commodore G. R. Beamish, took the parade of 250 R.A.F. cadets, and addressing them he said that H.M.S. *Daedalus* had presented the bell in return for the silver salver given to it by Cranwell to commemorate the link between the two establishments. The bell symbolized the affinity and close co-operation between the R.A.F. and the Royal Navy. "We have very long traditions in the Royal Navy," he said, "but you have a brilliant tradition second to none in any Service in the world. Given the aircraft and the ships, together we can defend these islands of ours while you could strike terror into the hearts of any aggressors in their seat of government."

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Mr. Arthur Henderson, Secretary of State for Air, addressing a meeting at Tipton (Staffs), said: "The Western democracies desire the friendship of Russia, but not her Communism. Russia, by calling off the cold war, ending the blockade of Berlin, terminating all forms of aid to the Communist guerrillas of Greece and other countries, could transform the international situation and secure a wide-open door to international good will and understanding."

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FAR EAST

Since the beginning of the year over 150,000 lb. of supplies have been dropped by the Royal Air Force to troops and police operating against bandits in Malaya. With its dense jungle and few roads, Malaya presents great difficulties to the movement of ground forces. If it were not for the R.A.F. Dakotas, whose aircrews can accurately place supplies of rations, ammunition and equipment on dropping zones often not more than thirty yards square and surrounded by tall trees, the range of action of the troops would be severely restricted.

Recently several columns engaged on operations in North-West Malaya were entirely maintained by air-supply drops for a period of four weeks. In addition to supply dropping, there have also been considerable air-lifts of troops and police to and from out-stations.

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Sea- and sun-bathing, hiking, climbing, cycling, moonlight picnics, and a great variety of games, amid striking tropical scenery, are available to airmen and airwomen of Air Command, Far East, who visit the new R.A.F. leave centre at Tanjong, Bungah, a small island off the Malayan coast. A holiday there costs them 1s. 4d. a day.

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The centre is even more spacious than the one it replaces, Fort Auchrey, which has now been returned to its owners. At ease in mufti, with swim-suits and shorts predominating, airmen and airwomen find Tanjong Bungah an ideal spot for relaxation.

Run by the N.A.A.F.I., with W.V.S. assistants, the centre comprises a large, well-built house, standing amid flowers and trees, with its own private bathing beach. In addition to dining-room, lounge, drinks counter and a rest room for airwomen, the building has sleeping quarters for eight airwomen. Outside, in the grounds, seventy airmen are housed in cheerful, well-appointed quarters.

The island is surmounted by Penang Hill, 2,800 feet high, which commands a magnificent view of the Malayan mainland. Round-the-island trips are arranged for centre residents, for whom bicycles are also available on which to explore the island's beauties and reach quiet spots for informal picnics. Six miles away is George Town, port of Penang, a mixture of modernity and old-world charm, easily reached by bus.

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GERMANY

The Berlin air-lift is not the only way in which the Royal Air Force has been helping to alleviate some of the widespread distress which still prevails in Germany. For the past nine months Operation "Ragbag" has brought aid to some of the three and a half million poverty-stricken German refugees, many of them from Russian-occupied territory, who have flooded into the British Zone.

The idea of collecting, repairing and distributing discarded clothing to these destitute exiles was originated by Lady Sanders, whose husband, Air Marshal Sir Arthur Sanders, then commanded the British Air Forces of Occupation. The scheme was started at Buckeburg, near Air Headquarters, where the refugee population is considerable. Garments were collected from R.A.F. stations in the zone and a number of wives of R.A.F. men of all ranks formed working parties to renovate and distribute them to deserving cases. German women were invited to join in and the organization began to grow.

An appeal to R.A.F. home commands met with a generous response. More than 600 bales of old clothing, shoes, etc., have already been sent to Germany. Three months ago a single appeal to the British public brought hundreds of parcels, and enough money to supply 1,500 blankets.

The organization, under the presidency of Lady Tedder, has now been extended to include a London committee. Additional working parties have been formed in Germany and are directed by Mrs. T. M. Williams, the wife of the present Air Officer Commanding-in-Chief.

Operation "Ragbag" is still in full swing. Parcels of clothing, etc., or donations to the Blanket Fund (all of which will be acknowledged), should be sent to R.A.F. German Refugee Scheme, c/o R.A.F. Association, 83 Portland Place, London, W.1.

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No. 5357 R.A.F. Airfield Construction Wing, British Air Forces of Occupation, Germany, is supervising improvements to the recently opened civil airport at Lohausen, Dusseldorf. A new 2,000-yard concrete runway is to be constructed. This will cross the Dusseldorf flood-clearance canal, which is to be diverted and straightened to simplify the necessary bridge construction. No. 5357 Wing was also in charge of earlier work on this aerodrome.

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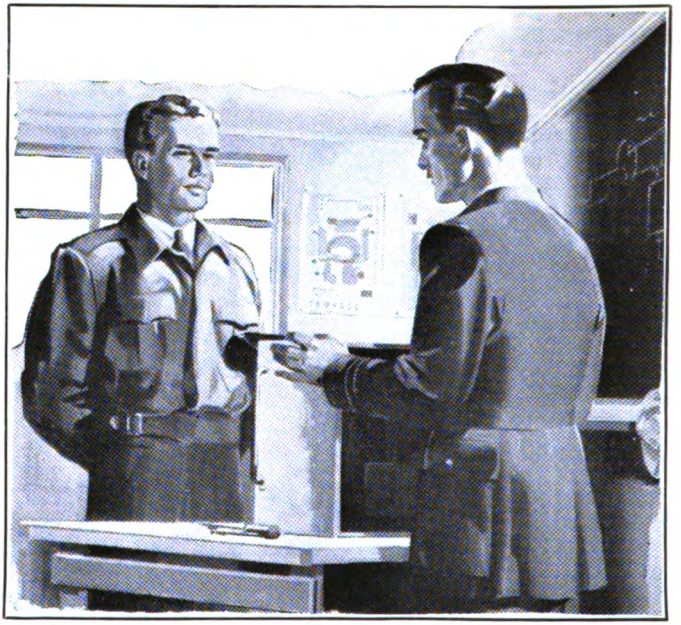

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AMERICA

At an impressive display of air power put on by the U.S.A.F. at Andrews Field, near Washington, the high-light of the show was a race between the Boeing B-47 Stratojet bomber and the Lockheed F-80 Shooting Star. As the planes passed the reviewing stand the bomber outdistanced the fighter, "to show you how the speed of bombers is changing the concepts of warfare," as General O'Donnell put it.

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Great Britain can claim a large share in the remarkable flight of a U.S. Air Force B-50 bomber which, refuelled four times, flew round the world—a distance of 23,000 miles—non-stop in ninety-four hours. The system of refuelling used by the Americans was invented and developed in Great Britain over the past fifteen years by Sir Alan Cobham and Flight Refuelling Ltd., the company which he heads.

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FRANCE

As the outcome of international discussions which have been referred to in the Press during the past few months, it is now officially announced that the Société Nationale de Constructions Aeronautiques du Sud-Est has signed an agreement with the De Havilland Aircraft Company whereby the De Havilland Vampire fighter will be manufactured under licence in France. This represents a further important step in the standardization of defence equipment for the countries of Western Europe, several of which have adopted the De Havilland Vampire as the high-altitude interceptor, ground-attack aircraft and general fighter for the defensive arm of their air forces.

The French Air Force has already taken delivery of a small number of Vampires supplied by the British Government, and to build up squadron strength while production is being organized it is proposed that further considerable quantities of Vampires will be supplied from stocks and from British production.

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On Friday, 8th April, Mr. John Derry, De Havilland experimental test pilot, won the Coupe Montana—a prize offered for the first flight from Paris to Cannes in under one hour—flying a standard De Havilland Vampire Mark 5 fighter. He covered the distance in forty-five minutes.

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GREECE

For the past two years American Army engineers have been preparing aerodromes and landing-strips throughout Greece. Recently the work was completed. Now ready are nine major airports, and numerous strategically placed airfields and landing-strips, all fully equipped.

* * * *

U.S.S.R.

Reports say that Russian transport aircraft production is now calculated at over 100 per month (equivalent American figure is seventeen per month). Close relationship of civil/military transport systems means that all aircraft of Russia's hundreds of air lines—headed by Aeroflot—are always available for instant military use.

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"Bristol"

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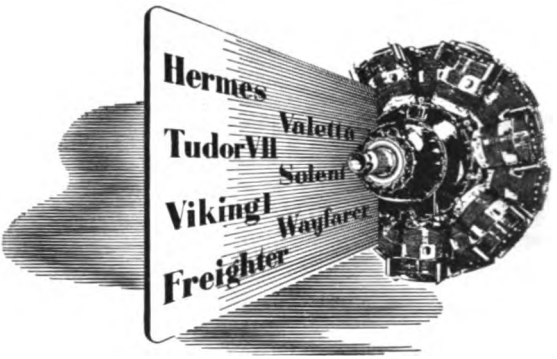

The list of aircraft powered by the famous "Bristol" Hercules engine grows longer; its direct descendant, the mighty 18-cylinder Centaurus, features, too, on many of to-day's high performance aircraft. The success of the Theseus—first propeller-driving gas turbine to pass a full official type test—still further establishes "Bristol" as the leading name in aircraft power-unit design and construction.

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BOOK REVIEWS

AIR AFFAIRS

Perchance : A History of British Naval Aviation. By B. J. Hurren. (Nicholson & Watson, London; 10s. 6d. net.)

The author of *Perchance* needs no introduction to readers of THE ROYAL AIR FORCE QUARTERLY, although this book is the product of Lieutenant-Commander Hurren, Naval War Commentator and Fairey Aviation executive, rather than the B. J. Hurren whose sparkling humour has so often cheered our pages.

In his Preface, Mr. Hurren explains that the title was chosen carefully, because "I cannot describe it as a history of ship flying, as I am sure many of the old things improvised in the early years are missing." Nevertheless, *Perchance* is both comprehensive and fascinating, tracing the growth of naval aviation from the stick-and-string era, through the years when it was "the Cinderella Service," wanted by nobody, to the Second World War, when it became the sharp spearhead of the Royal Navy's offensive power.

The narrative is arranged in three parts, of which the first—"Decks Cleared"—covers the period from 1909 to 1919. Here we see the character of the Service emerging from "that happy state of muddle, charming enterprise and official indifference in a military degree which has always characterized the nation." Great names stud the pages of this section of the book—Sir Francis McClean, whose generosity gave naval flying its start; Commander Samson; Sir Arthur Longmore; Winston Churchill, early advocate of sea-flying; T. O. M. Sopwith and Sir Richard Fairey, whose genius gave wings to the new Service; and others whose names are now almost legendary.

"Odd things improvised in the early years" are well represented by a photograph of an incredible seaplane built by Forrestt, of Wivenhoe, in 1909, which has to be seen to be believed! Other historic, and more practical, naval aircraft are illustrated, often by photographs from private scrapbooks, some of them hitherto unpublished.

The slow, costly process of learning to operate aircraft from ships at sea is dealt with in some detail, leading up to September, 1918, when, with squadrons of efficient torpedo-bombers and fighters in service, it seemed that the naval air arm would at last get a chance to justify its existence. Then came the Armistice, followed by drastic reductions in our armed forces, and the Service was back almost to where it started.

The next two decades, described in Part II, were gloomy ones for British naval aviation. Its very existence was often threatened, as its squadrons were given first to the R.A.F., which really wanted only land-based bombers, and then to the Navy, which did not want aeroplanes of any kind. The frequent changes of status are shown by the fact that, over a period of twenty-seven years, an officer remaining at basic lieutenant rank would have held no fewer than twelve different ranks and titles. It is, in fact, the intricacy of the story that has prevented Mr. Hurren from maintaining a strict chronological order throughout the book which is at times a little disturbing but possibly unavoidable.

In 1937 came the decision to hand over the Fleet Air Arm, as it was then called, to the Royal Navy. The change-over was barely complete when naval aviation found itself at war again, an ill-armed David against the mighty German Goliath. Well might any naval officer have replied, as did King Saul's captain of the host when asked "Whose son is this youth?" after David had slain the Philistine of Gath: "As thy soul liveth, O King, I cannot tell."

The achievements of naval aviation in the Second World War are recalled in Part III—"The Noon of Doing"—and not merely recalled but put into perspective against the overall background of the war. Bitter struggles in obsolete aircraft gradually gave way to glorious victories as new carriers and up-to-date aircraft came into service.

Naval aviation ended the Second World War with more than fifty carriers, and with its personnel increased to thirty-five times that of 1939. No longer a Cinderella Service, it had become the backbone of the Fleet. Great as its achievements have been, its future may well be greater, for, as Mr. Hurren points out, jet-propulsion and the atomic bomb can be given new mobility when allied to sea power. *Perchance* is thus not merely the story of past achievements: it is perhaps a first instalment of an even greater story yet to be told.

Vision Ahead. By Air Commodore P. Huskinson, C.B.E., M.C. (Werner Laurie; 11s. 6d. net.)

The only criticism that might conceivably be directed against Air Commodore Huskinson's excellent book is that the title gives no clear indication of its subject. It is true that,

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to those acquainted with the Air Force or armaments, the author's name will be a sufficient guide, but amongst a wider public there may be many who, through lack of special knowledge, will lose the opportunity of reading what has been so rightly described by Lord Beaverbrook as one of the most outstanding stories of the war.

In the broadest sense, *Vision Ahead* is an account of the author's Service life from the days of "fabric and piano wire" flying with the Royal Flying Corps of 1915 to the era of the ten-ton bomb of 1945. It must be said at once, however, that this is no ordinary autobiography. It is, as the author explains in his opening chapter, a book not about himself but about his job. The result is the story of air armament from virtually its beginning to the end of the Second World War, told in vivid style, without resort to technical jargon, by a man with a profound knowledge of his subject and the capacity for analytical thought and expression.

From the days of his first association with the Ordnance Board, at the time of Munich, Air Commodore Huskinson takes his readers behind the scenes into the realms of difficulties and achievements which characterized the development of "bigger and more beautiful bombs" and the complexities associated with lethal air weapons of all kinds. It is a story in which no punches are pulled.

It is difficult, in so well-balanced a work where the interest is sustained by a constantly changing pattern, to single out any particular aspect, but special mention might be made of the chapters on Bomb Disposal, the Möhne Dam and, above all, the few pages in which the author describes, with all the sober analysis of true courage, the tragedy which resulted in the loss of his sight. "It is only between the lines," writes Lord Tedder in a Foreword to this work, "that one can read the story of the courage and determination by which he won his way through, and inspiring that story is."

General H. H. Arnold, U.S.A.A.F., at whose hand Air Commodore Huskinson received the Legion of Merit in the autumn of 1945, also adds his tribute in a third Foreword, which concludes: "This work should, and no doubt will, reach a wide audience. Here, in sharp focus, is a clear picture of that strange combination of weakness and strength which always has characterized nations of free men, and which, in some inexplicable manner, enables them to rise to the challenge of necessity and turn back those who would take their freedom from them."

Such sentiments can be echoed with confidence.

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Vision Ahead. By Air Commodore P. Huskinson. 198 pp. (Werner Laurie, 1949.) (Author was Director of Armament Development, M.A.P., 1940.)

Aviation Medicine in its Preventive Aspects: An Historical Survey. By John F. Fulton (Yale University). 174 pp. (Oxford University Press, 1948.) (Heath Clarke Lectures at London University, 1947.)

The Helicopter. (The Story of the Helicopter.) By Colonel H. F. Gregory (revised by Squadron Leader W. J. D. Allan). 271 pp. (Allen & Unwin, 1948.)

The Air League Book: A Review of Post-War Aviation. With chapters on "Air Power and Imperial Defence," by Air Chief Marshal Sir Philip Joubert; "Naval Aviation," by Vice-Admiral Sir T. H. Troubridge; "Air Reserves," by Air Marshal Sir Robert Saundby. 96 pp. (Published for the Air League of the British Empire by Foley House Press, 1949.)

DEFENCE

U.S. Reserve Forces for National Security. By Gordon Gray (Assistant Secretary of the U.S. Army). (Report to the U.S. Secretary of Defense by the Committee on Civilian Components, 30th June, 1948.) With a Bibliography, Glossary of Terms and an Index. 211 pp. (U.S. Government Printing Office, 1948.) (Mr. Gordon was Chairman and the Assistant Secretary and a Brigadier-General of the U.S. Air Force were two of the five members of the Committee.)

First Report of the U.S. Secretary for Defense. By Mr. James Forrestal. 172 pp. (U.S. Government Printing Office, 1948.)

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MILITARY

From Salerno to the Alps : A History of the Fifth Army, 1943-45. By Lieutenant-Colonel Chester G. Starr (U.S. Army). 498 pp. (Infantry Journal Press, Washington, 1948.)

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The United States and China. By J. K. Fairbank. (American Foreign Policy Library series.) 384 pp. (Harvard University Press, 1948.)

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Way of a Fighter. The Memoirs of Claire Lee Chennault, Major-General, U.S. Army (ret.). Edited by Robert Hotz. (Putnam, New York, 1949.) (See also "Old Leatherface of the Flying Tigers," by Keith Ayling, published in 1945—also in the Library.)

ARTICLES OF INTEREST IN PERIODICALS

"The Economist," 19th March, 1949 : "What Kind of Army?"
"The National Review," April, 1949 : "Bomber Command in Land and Sea Operations."
"The Engineer," 18th March, 1949 : "The Changing Scope of Bombing Aircraft."
"Flying" (U.S.), March, 1949 : "Stalin's Strategic Airlines"; "Paper Air Force."
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JOURNAL

EDITOR
GROUP CAPTAIN A. H. STRADLING, O.B.E., R.A.F. (RET.)

Assisted by an Air Ministry Advisory Committee of members of the Royal Air Force and Air Forces of the Commonwealth

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EDITOR.

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A Lincoln bomber, one of the R.A.F.'s most modern bombers, drops a stick of twelve 250-lb. high-explosive bombs in a recent live bombing exercise

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EDITORIAL

WILL EXERCISE "ARIEL" GIVE US THE MEN WE NEED?

THE Frontispiece picture shows the most modern type of bomber that the Royal Air Force possesses. Is it obsolescent? A comparison between this and the A1 jet bomber, with a speed approaching 500 miles per hour, shows a marked difference. The Commander-in-Chief, Fighter Command, said after Exercise "Foil" that we possess the best fighter aircraft in the world. This is heartening, but if and when we have to engage the only possible potential aggressor, to be in a position to fulfil its tasks Bomber Command will want the most modern bombers that this country can produce, because it will have the lion's share of the work to do.

What else did Exercise "Foil" disclose?

Owing to the continued shortage of personnel in the R.A.F. in certain essential trades, the exercise could not be continuous, but had to be divided into three phases with one day's interval between each phase. It is also known that neither Regular nor Territorial gunners often have a chance to practise with more than one aircraft at a time in the ordinary way. In such exercises the guns are not manned, the exercises being confined to the radar and control sides down to the officer selecting the target.

Our fighter control units of the Royal Auxiliary Air Force are also seriously undermanned. In the recent exercises only those who were fully trained could be usefully employed. This was only an exercise, when the conditions are most favourable to our air arm. What would happen tomorrow if the full strain of a "shooting war" suddenly descended upon us? No one is stupid enough nowadays to believe that we should be given time to train men. Owing to the many fundamental changes in their trades, even those who were once highly skilled would require a refresher before they could come to the aid of the depleted units.

Officers and skilled men of our air forces, who have great responsibilities thrown upon them during this shortage, know the danger of our weakness; that is not enough. Only when the nation also knows and the possible consequences to every man, woman and child if we are attacked, and the danger that still exists of such an attack, shall we get the nation's enthusiastic support, our volunteers and increased efficiency in our air forces. The disappearance of present weaknesses in an otherwise efficient force would quickly follow. Our Government has a heavy burden and this problem is not of the easiest. We suggest that our urgent needs should be broadcast day after day to the nation, and the possible consequences of failure to meet them stated in the most emphatic terms. Our Air League should be made one of the most important organizations in the country and placed on the level of a National Air Council, to educate the nation by every possible means to the realization of the position and what is needed of them to remedy it. The recent Exercise "Ariel," to which the C.A.S. invited the controlling powers of our national labour, had as its aim the solving of the problem of man-power shortages in the R.A.F. We hope in our January number to be able to indicate the progress made, through this conference, towards solving our difficulties in this respect.

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IS TROUBLE BREWING IN THE BALKANS?

The danger spot is Albania. There are already 10,000 Soviet troops in this little Moslem state, and Russian and Polish ships are steaming into its port, Durazzo, with munitions of war, rapidly establishing a Soviet naval base in the Mediterranean, the only one she possesses.

The Russian-controlled radio station there continues to inflame the Albanians against Yugoslavia. Marshal Tito, already facing an unfriendly Bulgaria on his eastern borders, now has a potential enemy in his rear, cutting him off from the Adriatic. What is the next move?

He may enter a military alliance with Greece, who can offer valuable port facilities at Salonika. If jointly they try to clear up the unsatisfactory position by bringing military pressure to bear on Albania, it will face Moscow with a difficult problem. Although Russia continues her preparations for a war of aggression against the Western Powers, we doubt if she would wish to begin it prematurely. (Yet it was a smaller incident that started the 1914-18 war.)

Should trouble arise, knowing that the Western Powers would not tolerate surreptitious military support by Russia, all eyes will be focused on this veritable powder magazine in the Balkans.

The situation is pregnant with possibilities.

* * * *

THE "ROCKET-MISSILE": FOR INTERCEPTION

During recent exercises in America it was found that the jet fighter is not very effective in disposing of the *most modern* long-range bomber at altitudes over 35,000 feet. The fighters required about twenty-seven minutes to gain position to attack bombers approaching at 300 m.p.h.

This means that the bombers would be 150 miles nearer their target before the fighters could reach a height from which they could attack. On reaching the required height, pilots found their aircraft's manœuvrability reduced. Some now doubt whether the present fighters are equal to the task of efficient interception. The possible alternative is a "rocket-missile."

In a lecture, sponsored jointly by the National Air Council and the Library of Congress of America, J. Carlton-Ward described such a missile.

Being rocket-powered, it can climb to the required height very much faster than any fighter. At the instant it rises into the air it is immediately captured by an intelligence, which directs it towards the approaching bomber. The missile turns a very weak electronic signal into a power impulse by its "electronic circuit," which in turn puts into operation a "set of muscles," which are called "servomechanisms." When the missile gets to a point where it can see the enemy with its own radar eye, cutting itself off from ground control it starts its own "electronic brain" working. This calculates the speed of the oncoming bomber and its direction, makes a note of its own speed and direction, and then immediately performs a complicated mathematical operation of solving an equation which results in its intercepting the enemy "from the beam," so to speak. With exact and mathematical precision it blows itself up at the point of interception and with it the bomber.

This missile is not an imaginary device. It is near its final stage of development and it has accomplished separately each one of the operations. It now remains for it to do them all co-ordinately. This accomplishment will solve the problem of interception, at least for a while. Counter-measures will undoubtedly be developed; our brain reels at the speed at which the Air Age carries us along.

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WESTERN UNION DEFENCE

VISIT BY THE AMERICAN CHIEFS OF STAFF

The American Chiefs of Staff, who paid a ten-day visit to their opposite numbers in Western Europe from 30th July to 8th August this year, have given Western Union Defence "a very good chit."

According to *The Times*' Washington correspondent, General Bradley, the U.S. Army Chief of Staff and spokesman for his colleagues, told the Foreign Relations and Armed Services Committee of the Senate on 10th August that the U.S. Joint Chiefs of Staff "had examined the defence concept of Western Union on their visit to Europe and had found it in accordance with their own strategic thinking."

This flying visit to Europe by the American Chiefs of Staff has done more than secure for Western Europe much-needed dollar credits and materials for defence. It has to some extent forced the clarification of the defence situation and focused attention on a number of salient points.

In the first place, as several eminent authorities have pointed out, the nations of Western Europe require protection against invasion, not merely a guarantee of eventual liberation after being overrun and occupied for some years. But this reasonable request (we cannot call it a demand, for none of them is in a position to demand such a thing at present), this request, then, presents a very considerable problem, which is not solved by the general allotment of functions to the Atlantic Pact Powers—our second salient point.

The general idea seems to be that the United States would be responsible for long-range bombing (including the use of the atom bomb) and the protection of air-sea communications across the Atlantic; Britain would be responsible for fighter defence and tactical air support, for sea communications generally and for the defence of Scandinavia; while France would be responsible for the ground defence of Western Union and Italy. In support of this last, General Bradley is reported to have said that most of the arms for Europe should go to rebuild the French Army; but he also thought that it might take five or ten years for Europe to build a defence system which could halt any possible Eastern aggressor.

A third salient point is that America demands, as a condition of aid, that Western European defence shall be integrated, i.e., treated as one organization, and shall no longer be the resultant of the separate efforts of individual nations. In a word, it must be "collective defence." Judging by the words of General Bradley's report quoted above, this demand appears to be in process of satisfaction. But it is to be noted that collective defence, if it is to be most effective, requires a certain specialization of functions as is indicated by the allotment of tasks among the three leading signatories of the Atlantic Pact: the U.S.A., Britain and France.

This specialization involves a certain unbalance in the armed forces of individual nations, which becomes a balance only when all the national forces are looked at as one whole. Thus France would be relatively weak in aircraft and ships and Britain in land forces and long-range bombers. Only when supreme confidence in the organization is established can such unbalance in national forces be acceptable; yet it is the only way of organizing collective defence in present circumstances.

This justifiable insistence on collective defence raises the question: Should it be organized as one whole with all the twelve signatory countries acting together under central direction, or should it be split up into regional groups, e.g., (i) the

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Brussels Treaty Powers; (ii) the Scandinavian countries; and (iii) the Mediterranean Powers? This question has not yet been decided—it has not even been discussed very much; but it is an important one. To attempt to operate the Atlantic Pact as one huge machine would have the disadvantages inseparable from all large organizations: slowness, and insufficient knowledge at the centre. Regional groups, on the other hand, would be better informed and more efficient organizations and would still have the advantage of integration. There is, moreover, no reason why one nation should not be a member of two or more groups, e.g., France is both a member of the Brussels Pact group and also a Mediterranean power, while Britain could support all three groups with air and sea forces. The U.S.A. and Canada would also lend their aid to all three groups.

A fourth salient point that emerges from these talks is that America's part is going to be bigger than was at first thought; for it is now recognized that American military strength is the sole guarantor of Western European independence. Not only will the U.S.A. have to support the nations of Western Europe with naval and air forces but she may also be called upon to provide land armies as well, at least until France and the other Brussels Pact Powers can produce land forces adequate for the proper defence of Western Europe—if they ever can. And she must also provide the drive to overcome the deep-rooted nationalism which instinctively opposes the proper integration of international forces.

Some progress has already been made in this direction. The signatories of the Brussels Pact have agreed in general terms on an operational plan if one of them is attacked; they have held joint exercises at sea and in the air; there has been a certain amount of standardizing of staff methods and communications; and the Commander-in-Chief's Committee is functioning satisfactorily under Lord Montgomery. But there is, as yet, no real integration of forces and no proper coordination of armaments production; national defence budgets still bear no relation to one another; joint training and the standardization of arms and equipment are only just beginning; and purchases of war material are restricted by economic circumstances.

From these salient points which have emerged from the Chiefs of Staff's visit some important questions arise. The Atlantic Pact guarantees support in case of invasion; but how can it prevent a member from being overrun by an invader? Can Western Europe produce land forces capable, even with the help of American strategic bombing, of halting a Russian invasion of Western Europe? We are forced to the conclusion that the land defences of Europe cannot be left to France and Benelux; and that there is need for a concentration of the whole power of all the members of the Atlantic Pact on the frontier of Western Europe.

And that immediately raises another question: Where is that frontier to be? Is it to be on the Elbe or on the Rhine? If on the Elbe, then Western Germany will have to be rearmed; and if on the Rhine, then we are sacrificing to the enemy a large and valuable part of Western Europe. To this question there is, as yet, no answer.

A further question is: What part should Britain play in the land defence of Western Europe? France would doubtless like to see another British Expeditionary Force sent to help her on the Continent. But while Britain is vitally interested in Europe, she has equally important interests in other parts of the world, especially in the Middle East, at Singapore and at Hong Kong, all of which make urgent claims upon her very slender land forces. It is naturally difficult to explain this to a comparatively weak Western European nation which feels itself in danger of being overrun by a powerful Eastern neighbour.

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COMMAND AND LEADERSHIP

By Air Chief Marshal Sir John Slessor, G.C.B., D.S.O., M.C.

[*Air Chief Marshal Sir John Slessor: commanded No. 5 Squadron, 1925-28, No. 3 Indian Wing, 1935-37, No. 5 Bomber Group, 1941-42, Air Officer Commanding-in-Chief, Coastal Command, 1943. Commander-in-Chief, R.A.F., Mediterranean and Middle East, 1944-45. Although at present Commandant of the Imperial Defence College, his appointment as Chief of the Air Staff, vice Lord Tedder, with effect from 1st January, 1950, was recently announced.*]

A GOOD many years ago, when I was at the Army Staff College at Camberley, one of my colleagues on the Directing Staff was one Lieutenant-Colonel Slim, of the Indian Army. But the fact that he is an old friend is not the only reason that prompts me to borrow unblushingly from the Field-Marshal's lectures on this subject of leadership. Not only has he vast experience of command and leadership in war but I am sure anyone who has heard him lecture or broadcast will agree that he has a genius for dealing practically, wisely and humanly with those rather abstract subjects, like morale and leadership. So much of what is written in this article is drawn from that source, though I will try also to give you the benefit of my own experience in this line.

All of us, I suppose, were brought up on the deathless tale of the charge of the Light Cavalry Brigade at Balaclava in the Crimean War. "Theirs not to reason why, theirs but to do or die," and so, if you remember, "into the Valley of Death, rode the six hundred." "C'était magnifique, mais ce n'était pas la Guerre"—or, anyway, it wasn't how modern war should be waged. Let's face it: it was a gallant but rather stupid show for which a commander in these days would rightly lose his job.

Do not imagine for one moment that I decry the value—the literally vital importance—of obedience to orders, obedience even to the death. On the contrary, I have thought sometimes that we do not always nowadays attach enough importance, for instance, to the old principle that if you are ordered to defend a position that means the last man and the last round. No. What I do suggest is that in modern war blind, unquestioning, unintelligent adherence to an order, in circumstances which have obviously changed since the order was given, or which were clearly unknown to the commander who gave the order, may be a serious menace. I hesitate to cast doubt upon another of the legends of our youth, but, if my memory serves me right, the boy who stood on the burning deck whence all but he had fled did so because he had been told to—not because he could do the slightest good to anyone by standing there and getting blown up. A brave lad, no doubt, but he seems to me to be in an entirely different category from those officers and men of the Oxfords who fell in and stood as steady as rocks on the deck of their sinking troopship, the *Birkenhead*, while the women and children were saved.

They used to have a very good habit in the German Army. In some of their big war games and other exercises, the directing staff used to introduce a situation deliberately designed to see whether a subordinate commander had the training, the common sense and the initiative to disobey or depart from his orders when it became obvious that the situation had changed or that his orders had been given him in ignorance of the real situation. If the chap concerned stuck slavishly to his orders, then he got a black mark.

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Now, this is obviously a pretty tricky business. It manifestly involves the risk of the chap who is not very determined or very steadfast saying, "Oh, well, the circumstances have quite clearly changed since the group captain gave me that order; I must now use my own initiative and not push home this attack or defend this position to the last man and the last round, because it would obviously be silly to do anything of the sort in the circumstances as I now see them." But I think that risk has got to be accepted—I don't believe it is a very serious risk. And I stress this point because I think it is a pointer to what I believe is the essence of command in these days—and indeed in any day, for that matter. Old Oliver Cromwell, 300 years ago, asked for the plain, russet-coated captain "who knows what he fights for and loves what he knows." In other words, this business of "theirs not to reason why" does not make sense. The captain of aircraft, the company commander, or whoever he is, must be told what the situation is, what he has got to do and why he has got to do it. And tell him as much as you think will help him, or is essential to co-ordinate his action with others, of *how* he is to do the job. But, for heaven's sake, don't tell him too much of that. Stick as closely as you can to the principle of giving your man a job to do and leaving him to do it in his own way. And if he does it well, don't forget to give him a pat on the back; if he does it badly—well, you mustn't let him make a habit of that and remain in a position of responsibility. I'll come back to that later on.

Incidentally, I think it is significant in this connection how that word "briefing" has crept into use since the beginning of the late war. I believe it has spread from the R.A.F. to the other Services, and it does seem to me to be very descriptive of the methods by which the modern commander on the lower levels makes known his wishes and intentions to his subordinates.

I think it must be obvious to us all that this type of command in these days does call for very special qualities of leadership on the part of the commander. Sir William Slim has defined leadership as the projection of the personality of the commander. And, in these days of wars of vast areas and huge numbers, it is far more difficult for the commander to get his personality across to his men. After all, in the Peninsula or at Waterloo the old Duke rode along the Thin Red Line and doffed his cocked hat and said: "Up, Guards, and at 'em," or "Let battle commence," and Sam Small and his fellows said: "Ba gum, there's t'oad so-and-so hisself," and took heart of grace. That sort of thing used to happen even in my lifetime—I was reading the other day a personal account of the Battle of Omdurman (1898) in which the writer described how, when a dervish charge had been broken but the men were still excitedly blazing away, the "familiar voice," as he put it, of the Commander-in-Chief, Kitchener, behind him was heard saying: "Cease fire, please, cease fire; this is a terrible waste of ammunition!" I am sure many senior commanders in both the last two world wars must have envied the old boys of those days their opportunities of direct contact with the men they commanded—I know I did. Last time it was not nearly so easy—anyway, in the Army and Air Force. Different commanders had different methods. Some went in for eccentricities of raiment; some made great use of the agents of publicity—and do not underrate the importance of these things; to some extent these registrations of personality, or their photographs in the paper, replace the personal sight of the commander-in-chief on his horse with his cocked hat and sword. But all the best generals were those who took every opportunity of going up forward and talking to and being seen by the officers and men in the fighting units: Slim, with his "forgotten army" in the jungles of Burma, Montgomery turning a defeated, dispirited force into a victorious army in a few weeks before Alamein, by sheer force of personality.

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In the Air Force—apart from the fact that we have those two broad subdivisions into the men who fly and fight and the men who work on the ground, which I shall come back to later—I think it is more difficult even than in the Army for a senior commander to maintain the necessary contact with those under his command. There were occasions, of course, when it was relatively easy—Keith Park constantly flying round his stations in No. 11 Group during the Battle of Britain; Roderick Hill as Commander-in-Chief, Fighter Command, flying his own fighter in the battle against the V1; Coningham in his caravan with the Desert Air Force. When that was practicable it always reaped rich dividends. In Coastal Command we had the devil of a problem. The squadrons were scattered not only all over England, Scotland and Northern Ireland but also in Iceland, The Faeroes, Gibraltar and the Azores; no commander-in-chief can possibly get round a command of that kind nearly enough. I used to supplement my all-too-rare tours by periodical personal letters to all squadron commanders and by writing in the *Coastal Command Review*—a monthly review which nearly all aircrews read. I believe that both these things paid dividends, and I commend them to the attention of future commanders who may find themselves in similar circumstances. But, of course, they are not the equivalent of frequent personal visits.

You get the occasional freak. Harris, for instance, of Bomber Command. Though the actual area in which his squadrons were based was not big, he practically never visited a station, and I suppose hardly one in a thousand of his chaps ever saw him. Yet he somehow succeeded in getting his personality across, and maintained the morale of his command for over three years in the face of casualties on a terrific scale. I frankly don't know how it was done. I can only think that somehow the passionate sincerity of his own belief in the supreme importance of Bomber Command to the issue of the war permeated down and communicated itself to his men. Anyway, no one who took part in the first Bomber Command Reunion at the Albert Hall this year could doubt that Bert Harris had qualities of leadership of a very special kind.

The Navy, of course, are the lucky ones. It is quite impossible to exaggerate the value, in this sphere of leadership and morale, of the fact that every man-jack, from the admiral to the latest-joined cook's mate, goes to sea and has his own job to do in the same battle and is liable to get blown sky-high if he's unlucky. Naval officers certainly take splendid advantage of their opportunities, but there is no doubt that they have a much easier job in this respect than we in the R.A.F. or in the Army.

Before we leave this question of personal contact, just a few more words about it on a rather lower plane, for, after all, we don't all of us become commanders-in-chief, and good leadership is just as important in the rather less exalted ranks. First, remember always that you are dealing with ordinary human beings like yourself, with the same sort of feelings, the same qualities and failings, the same hopes and fears. Never talk down to men. And don't overdo it—the occasional heart-to-hearter with non-commissioned officers or men (at which their officers should also be present) is good; if repeated too often it becomes a bore and loses its effect—becomes, indeed, a menace. You won't overdo it if you remember Sir William Slim's advice to talk to them only when you have something worth hearing to say to them, to know what you are talking about and yourself really to believe what you are saying. Absolute sincerity, of course, is a *sine qua non*; troops are quick to spot the flat catcher, and any taint of the bogus is nearly always detected and distrusted. And remember it isn't only what I may call the first-flighters that you should take into your confidence and put in the picture, but

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also the less glamorous chaps—not only the aircrews or the tank crews or the commandos who do the actual fighting and get the medals (and, of course, the casualties), but the clerk, the storeman, the R.E.M.E. fitter or the R.A.S.C. driver. Every man in the unit, from the commanding officer to the humblest aircraftman or seaman, is an essential cog in the machine—if he isn't he's got no business to be there. And you'll get better value out of your squadrons if you sometimes have a talk to, for instance, the cooks who have to get up at 3 a.m. to prepare meals for the crews on the dawn show, and tell them what it's all about. This is particularly important in the Air Force, where we have these two main divisions: those who fight in the air and those who work on the ground. There is no getting away from it, that does complicate leadership in an air force. But not insuperably so, and the good commander will always weld the two lots together as a team and have his ground personnel taking an intense personal interest and pride in the efficiency of the unit and the deeds of the aircrews.

Just one word about humour. A very dangerous subject! You may remember Slim's story of the enthusiastic little sergeant who, at the end of a talk about an impending offensive, warmly assured the general that when the day came they would be behind him to a man; and Slim's reply: "Don't you believe it, sergeant; when the day comes you'll be the hell of a long way in front of me." That sort of spontaneous, salty humour is worth a guinea a minute. But there is nothing worse, nothing more embarrassing, than forced humour. I think the only advice here is: never try to be funny; if you are made that way the opportunities will come to you; if you are not, no one will think the worse of you. But, anyway, try always to look cheerful or, at least, not to look miserable. Remember that, especially when times are bad, your men will be watching you and catching the mood from you. God knows I do not mean to suggest that you should always be frightfully hearty—war is quite bad enough without that! Someone—I think Disraeli—once said that no one should look anxious except those who have no reason whatever for anxiety, and I think that just about sums it up.

And don't sentimentalize about your men. You are responsible for their efficiency and well-being, and that must be the concern of an officer before his own comfort. It is obviously unnecessary today to say that men must not be treated like cattle, as they were in the bad old days. But I think there is discernible sometimes nowadays a tendency to go too far the other way, to sentimentalize over them, tell them what marvellous chaps they are, pamper them and pack them off in a bus to Mother every week-end. It isn't good for them and they don't like it—not if they are the right sort of men in the right sort of unit.

I have stressed this problem of personal contact between commanders and their subordinates because I believe it is the most important factor in the subject of this paper. I want now to examine the main elements that go to make up this quality of leadership, or power of command. The C.I.G.S.—to quote him again—has categorized them as Will-power, Courage, Knowledge, Judgment, and Integrity.

Will-power, the capacity to make up his mind, to take a decision and stick to it, is perhaps almost too obvious a quality—no one can be a good commander without it. Of course, I have known commanders who have confused strength of will with obstinacy, who stuck to a decision just because they had made it, regardless of how silly it may have been or have become with changing circumstances. That is not strength of character—actually it is the reverse, and is usually the sign of the stupid man who is afraid of admitting himself wrong. Someone—I think, Colonel J. F. C. Fuller at the Staff College many years ago—said: "If a man can't change his mind it probably means he hasn't got a mind to change."

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A commander can and should be flexible-minded without being vacillating—without raising those three fatal bogies Order, Counter-order, Disorder. But any man in any position of really responsible authority is constantly having to make decisions which, if things go wrong, may have very unpleasant results—a lot of unnecessary widows during a war for the soldier, or a lot of unpleasant publicity and perhaps the hell of a row in the House for the policeman in peace. But these possible consequences have got to be faced; you have got to back your judgment, make your decision and have the strength of will to see that it is enforced and obeyed right down through the echelons of command to the pilot in his cockpit or the rifleman in his foxhole or the policeman on his beat. Don't fall into the mistake of imagining that because you, as a high commander, have made a decision and given an order, it will necessarily be carried out in the way you intend when it gets right down to the bottom of the chain of command. No doubt it ought to happen that way, but my experience is that it very often does not do so unwatched and unaided.

And it is extraordinary how quickly any faltering of decision, any weakness of will at the top, filters down in some mysterious way to the bottom—and the converse. Look, for instance, at the effect on the Eighth Army of Montgomery's decision to cancel all preparations for the defence of the Delta; look at the extraordinary way in which Bert Harris's iron determination to destroy Germany communicated itself right down to the crews in the air and the maintenance men at work at their cold and wet dispersal points.

So a good commander must have the strength of will to make a decision and pursue an unfaltering course, *and* to change that course instantly if the situation so requires, as we had to do in the Battle of the Atlantic when, in 1943, the U-boats suddenly dropped the pack attacks on the convoys and we had to find some other way of killing them. And one of the hardest trials of his will-power is to persist in what he knows is the right course in spite of heavy casualties—to sit back perhaps in a comfortable office while his men are being killed. But he is no good if he can't face that, and he must remember that five hundred casualties this week may save fifty thousand in months to come. That is a thing some commanders sometimes forgot in the late war.

Now for *Courage*. We needn't waste much time on physical courage; nearly all men have that—not all, but nearly all. And I think one can usually assume that a commander will not have become a commander—he certainly will not remain one for long—unless he has his fair ration of physical guts. Perhaps in this connection I might say a word about fitness, or perhaps, to be more accurate, endurance. I have never been one of those who believe that a commander should always run a couple of miles before breakfast and never drink or smoke. But it isn't only fear that a commander has to resist: it is also fatigue. He has got to be prepared when necessary to be up all night—perhaps several nights running—and yet keep his mind clear and be capable of making a decision. That he can't do unless he keeps himself reasonably fit and gets as much sleep as he can when he can. For a really senior commander, a commander-in-chief, it should very rarely be necessary and never desirable to sit up all night. The decisions he may have to make in the day time may be so momentous that he should always be as fresh as humanly possible.

The other form of courage, a great deal rarer than physical courage but every bit as important in a commander, is moral courage. A leader of men has got to be prepared to do what he believes to be the right thing, regardless of how unpopular it may be or of the consequences to himself. I know it is easy enough to say these rather high-sounding things, but I do think it is necessary to say that

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a commander should never in any circumstances allow the thought "How is this going to affect me?" to dwell for one moment in his mind.

In particular, may I urge you to have the moral courage—and, let's face it, it does require some guts, especially if you like the chap—to report adversely on a subordinate if he really deserves it? As an ex-Air Member for Personnel I can assure you that it is often extremely difficult to get an honest adverse report when one knows for a definite fact that the officer concerned deserves one and, what's more, that his commander knows he deserves one. That sort of thing is usually based partly on a mistaken idea of kindness. I remember long ago a senior officer saying cynically: "Gentlemen, the Army is a club, and in a club one does not brawl." The Services are *not* clubs; they are desperately serious professions which should never harbour inefficients. And if you take the line "Oh, well, old Bill's a nice old thing; true he's not much use, but he's not doing much harm and, anyway, it would be bad luck on his wife and children to have him broke," you are letting down not only old Bill's brother-officers but the men who have to serve under him and the country that old Bill is paid to defend.

Turning now to *Knowledge*. We need not dwell much on that. It must be self-evident that a man cannot be a really good commander unless he really knows his job—and a great deal about the jobs of the officers and men under him. Obviously this does not mean detailed technical knowledge. Only the most junior commander can and should have a sound working knowledge of the technical job of each man under him; if more senior officers, commanding large units and formations, try to know all about every man's job they will never see the wood for the trees and will be a public nuisance, not to say danger. This, of course, applies more strongly the higher one goes in the hierarchy of command. A corps commander can't be expected to be able to fight a tank or build a Bailey bridge, any more than an air marshal can be an expert operational pilot or know all about the guts of a radar set. They must have been able to do this sort of thing in their day, but if they try to do it now they will merely be wasting time which they should be spending on the proper exercise of their command—and, anyway, they'll probably break their necks. Please do not take this to mean that I don't think air marshals should fly—on the contrary, I think it essential that they should. What I do mean is that if they are always doing what flight lieutenants are paid to do it can only be at the expense of what *they* are paid to do—command.

No. What senior officers must know from past practical experience, from careful objective analysis of present experience and from study (including the study of history) is what can be done and what is the best way of doing it, how long these things take and what are the difficulties and dangers and hardships involved in doing them.

There is clearly a pretty narrow dividing line between this and the next quality in Sir William Slim's list—*Judgment*. Indeed, judgment must be based on knowledge. Beware of the chap who thinks he can do the right thing instinctively, which usually means he can't be bothered to get down to it and really study his job, but hopes it will be "all right on the night." Judgment is largely a question of balance—but not too much balance; the chap who has in excess what someone once called "the lawyer's terrible capacity for seeing both sides of a question" is liable to find himself unable to make a decision. Nor is knowledge in itself a guarantee of judgment. Several of the cleverest men I know have no judgment at all. Lord Swinton tells in his book of Stanley Baldwin's comment on someone who had committed some particularly outrageous error of judgment: "He could never have done that, Philip; it takes a really clever man to be such a bloody

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fool." No; judgment can be cultivated to some extent and certainly grows with experience—that is one of the arguments against too rapid promotion. But I'm afraid if you really have no judgment you are unlikely to be able to develop it much—and without it other qualities such as will-power and courage will, as the C.I.G.S. has pointed out, become a positive danger. There are few things more perilous than the chap with no judgment but with guts and determination—he is almost as dangerous as old Moltke's third category of officer. You may remember he said something to the effect that there were officers who are clever and hard-working—they make good staff officers; then there are some who are clever and idle—they should be marked down for high command; but the chaps who are stupid and hard-working—they are a danger to the Service and should be got rid of immediately.

Finally, *Integrity*. I have already said that in talking to men absolute sincerity is an essential. Actually that is true of all dealings with men. A commander is no good unless he can inspire loyalty in his men. But, remember, loyalty is not a one-way street; if your men are to be loyal to you, you must be loyal to them, put their welfare before your own and never call on them to do anything that you have not done, or been ready to do, yourself. I don't think it would be possible to sum up this quality of integrity better than in a splendid sentence which is engraved on the Winchester War Memorial:

"Thou therefore, for whom they died, seek not thine own, but serve as they served and, whether in peace or in war, bear thyself ever as Christ's soldier, gentle in all things, valiant in action, steadfast in adversity."

I think I will end by giving you another quotation which seems to me to sum up magnificently the whole art of leadership. It is taken from John Buchan's book on Montrose, and here it is:

"First, there will be fortitude, the power of enduring when hope has gone, the power of taking upon oneself a desperate responsibility and daring all. There must be self-forgetfulness, a willingness to let worldly interests and even reputation and honour perish if only the task be accomplished. The man who is concerned with his own repute will never move mountains. There must be patience, supreme patience, under misunderstandings and setbacks and the muddles and interferences of others. There must be resilience in defeat, a manly optimism which looks at all the facts in all their bleakness and yet dares to hope. There must be a sense of the eternal continuity of a great cause, so that failure will not seem the end and a man sees himself as only a part in a predestined purpose. . . . Leadership, then, depends primarily upon moral endowments."

I am certain that the close contact and wise co-operation of our defence forces will contribute greatly to the protection of our countries and democratic way of life against any perils which might threaten our common resolve for peace.

Exercise "Foil" was not only a confirmation of the legendary valour of the Royal Air Force, but evidence of far-reaching organization.

—The French Secretary of State for the Air Forces, M. Jean Moreau.

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Air Chief Marshal The Hon. Sir Ralph A. Cochrane, K.C.B., K.B.E., A.F.C., Air Officer Commanding-in-Chief, Flying Training Command

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BIOGRAPHY:

AIR CHIEF MARSHAL THE HON. SIR RALPH A. COCHRANE, K.C.B., K.B.E., A.F.C.

By A. H. Narracott

AIR CHIEF MARSHAL SIR RALPH COCHRANE, the present A.O.C.-in-C. of R.A.F. Flying Training Command, is one of the all-too-small number of men of whom it can be said that they have brought the same refreshing energy, enthusiasm, initiative and skill to every important task they have been called upon to undertake. Many people envy such versatility, but there are not many, in any walk of life, who can emulate it.

Ever since he reached senior rank it has invariably been Sir Ralph Cochrane's fate to be in the thick of the fight, both in peace and war. During the period of the recent war when our air offensive was mounting in scale, intensity and effectiveness he had charge of Bomber Command groups. When the war had been won and members of all three Services, prisoners of war and internees were pouring back to the United Kingdom from battle areas all over the world, he was at the helm of Transport Command, who carried thousands of them home and did a magnificent job. Now, when the Royal Air Force is building up again after the run-down of the immediate post-war period, it is his responsibility to supervise the training of the aircrews who will man the new generation of fighters and bombers needed for this "jet age."

Nobody is better qualified for this important office. In 1936, at the request of the New Zealand Government, he was sent to the Dominion to prepare a report on its air defence. Having completed this task, he was asked to stay on to implement his proposals, and became the first Chief of the Air Staff of the New Zealand Air Force. At that time it was a minute force within the Army and, as is the fate of small brothers, was getting very little of the admittedly inadequate funds provided for the Services. The first objective, therefore, was to form a separate, independent Air Force. When this had been accomplished the foundations were so well laid that in the late war the R.N.Z.A.F. was in a position to send to Europe a steady stream of well-trained aircrews who acquitted themselves well. Their high standard owed a great deal to the training organization created by Sir Ralph Cochrane during his two-year stay in New Zealand.

His knowledge of training was further increased when, in October, 1940, he was appointed Director of Flying Training at the Air Ministry—a position which he occupied for almost two years. Still more experience in this direction came at Transport Command, for many of the pilots and crews used to ferry home troops when the war ended were bomber men and had to be converted as quickly as possible to the very different technique of carrying passengers instead of bombs.

Many people believe that Air Chief Marshal Cochrane is destined one day for the highest post in the R.A.F. He has all the necessary qualifications—a keen,

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ready brain which can sift the essential from the chaff; a broad vision, a grasp of strategy and tactics which embraces the other two Services; a somewhat rare ability to express himself with equal facility in speech and on paper; powers of leadership and of getting the best out of those under his command. He does not subscribe to that "the-Air-Force-can-do-it-all" attitude of mind which one sometimes encounters; on the contrary, he has often emphasized the interdependence of the three fighting Services. If he had his way such outworn terms as "sea power" and "land power" would be abandoned in favour of "fighting power," as applied to the combined force available to fight side by side in their respective elements. After all, Coastal Command had a big say in "sea power" during the protracted Battle of the Atlantic, and No. 84 Group and Bomber Command were indispensable to the Army during the final advance which carried "land power" from the Normandy beach-heads to Berlin.

The Hon. Ralph Alexander Cochrane was born at Cults, Fife, on 24th February, 1895, the youngest son of Lord and Lady Cochrane of Cults, and was educated at Ardvreck, Crieff, and the Royal Naval Colleges at Osborne and Dartmouth. Like many other distinguished R.A.F. leaders, his first Service experience was gained in the Royal Navy. During the first years of the First World War he was a midshipman and sub-lieutenant in H.M.S. *Colossus*, serving with the Grand Fleet, but in March, 1915, as a sub-lieutenant, joined the Airship Wing of the R.N.A.S. In 1916 he was at Scapa, and in the following year was employed as a test pilot. In 1918 he was appointed Captain (Dirigible) in the Air Force, and was sent to Italy to take delivery of an Italian semi-rigid airship. Soon after the Armistice he went to the R.N.A.S. airship base at Pulham.

In 1919, having received a permanent commission in the R.A.F., Cochrane was posted to the R.A.F. airship base, Kingsnorth. That year he won the A.F.C. Later he served on various duties in the Middle East, Palestine and Iraq, serving for two years as flight commander in No. 45 Squadron, under the command of Squadron Leader A. T. Harris. From 1923 to 1925 he commanded a squadron in the Apprentices' Wing at Cranwell, and during this period was mentioned in despatches. He next took the R.A.F. Staff College course. From 1926 to 1928 there followed more staff duties at home and in Aden, followed by a year in command of No. 8 Squadron during a period notable for the pioneering of Air Force control in South-West Arabia. A year later he returned to the United Kingdom as an instructor at the R.A.F. Staff College.

In 1935 he was awarded the Gold Medal of the Royal United Service Institution.

At the beginning of 1936, after two years in the Plans Division of the Air Staff at the Air Ministry, Wing Commander Cochrane joined the training staff of Headquarters, Inland Area, to succeed Group Captain H. V. Champion de Crespigny, M.C., A.F.C., who had been promoted in the New Year Honours List. Later that year he was placed on the Special Duty List on being sent to New Zealand on temporary loan to the Dominion Government. Reference has already been made to his two-year stay in New Zealand and to what he accomplished there.

On his return he was posted to the Air Ministry (1939) as Deputy Director of Intelligence, with the rank of group captain and the special task of advising on the strength of the German Air Force. In the month that war broke out he was appointed Air Aide-de-Camp to the King, succeeding Air Commodore J. C. Slessor (now Air Chief Marshal Sir John Slessor), who relinquished his appointment on being promoted air commodore on 1st September. In the same year Group Captain Cochrane received the C.B.E.

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Towards the end of 1939 he assumed command of the R.A.F. station at Abingdon, Berkshire. In 1940 he was successively S.A.S.O. at Headquarters, No. 6 Group, and A.O.C. No. 7 Group, controlling a number of operational training units. In October, 1940, he became Director of Flying Training, Air Ministry, holding this position for almost two years. Then, in September, 1942, came command of No. 3 (Bomber) Group for about six months, followed by two years as A.O.C. No. 5 (Bomber) Group. This latter group was permitted to operate its own marking and pathfinder force. It was at this stage, owing principally to the pioneering work of Group Captain Cheshire, V.C., and to the careful studies of such men as Air Commodore Satterley and Air Commodore Elworthy, that the R.A.F. began to develop the system of low-level marking which ultimately enabled targets to be attacked at night with greater precision than could be attained by any other means. Notable successes gained by No. 5 Group during the period of Sir Ralph Cochrane's command included the breaching of the Moehne and Eder Dams, the severing of Dortmund—Ems and Mittelland Canals (the former on no fewer than five occasions); the sinking of the battleship *Tirpitz*, and the destruction of a number of vital oil and railway targets. In 1943 Sir Ralph Cochrane was again mentioned in despatches and received the C.B., and in January, 1945, a K.B.E.

In February, 1945, Air Marshal Cochrane was appointed A.O.C.-in-C., Transport Command, and thus took on the difficult task of organizing and controlling the largest-scale British air-trooping operations to date. At its peak the Command ran twenty-four services a day to India and was responsible for a service round the world three times a week, as well as for almost innumerable local services in all parts of the world. In spite of the hazards and difficulties of its task and the rapid growth of Transport Command, its accident rate compared favourably with that in pre-war civil aviation. The ultimate transfer of much of its work to the civil air-line corporations had early been envisaged, and the close working maintained with the civil operators did much to smooth British European Airways' task when it assumed responsibility for the European routes. A lecture which Air Marshal Cochrane gave before the Royal Aeronautical Society in 1947, describing the development of air transport during the war, won for him the Edward Busk Memorial Prize awarded by the Society.

In August, 1947, on the retirement of the late Air Marshal Sir Arthur Coningham (who was lost in the B.S.A.A. Tudor air liner *Star Tiger* in January, 1948), Air Marshal Cochrane became A.O.C.-in-C., Flying Training Command, being followed as head of Transport Command by Air Marshal Sir Brian Baker. He was promoted air chief marshal in April, 1949, at the same time as Sir George Pirie, Air Member for Supply and Organization.

Last May Sir Ralph Cochrane was given the responsibility for organizing the third annual R.A.F. staff exercise called by the C.A.S., Marshal of the Royal Air Force Lord Tedder, which this year took the form of a conference on man power with the object of deciding how the needs of the R.A.F. could best be dovetailed into the nation-wide demand for skilled man power in the light of the limited resources available. Some two hundred representatives from many branches of civil life met a similar number of R.A.F. senior officers to exchange ideas on how the problem should be tackled so that skilled men's services should not be wasted. Although the conference was not intended to frame policy, important consequences for recruiting may well flow from it.

In 1930, when a squadron leader, Sir Ralph Cochrane married Miss Hilda Frances Holme Wiggin, third daughter of the late Mr. and Mrs. Francis Holme Wiggin, and they have two sons and a daughter.

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[Photo: Air Ministry Crown Copyright Reserved

The light rocket projectiles. Arming a fighter aircraft before take-off

[Photo: Air Ministry Crown Copyright Reserved

Light rockets in attack on enemy headquarters. This building on the island of Calino, on the completion of the rocket attack by fighters, was utterly destroyed

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THE FUTURE OF AIR BOMBARDMENT

By Air Marshal Sir Robert H. M. S. Saundby, K.B.E., C.B., M.C., D.F.C., A.F.C.

I THINK that I should emphasize, at the start, that the ideas and views set out in this article are my own, and are not necessarily, or even probably, those of the Air Staff today. It is perhaps legitimate to hope that, in thus setting them forth, I may do something to stimulate thought and discussion on subjects which are certain to have a profound effect on the future of our Service.

In my article in the July number of The Royal Air Force Quarterly we traced the development of bombing in the Allied air forces from its beginning to the dropping of the atomic bombs on the Japanese cities. This event was rightly recognized as a major landmark in the history of air power, but it marks a change not in kind but in degree. As I said, the effect is to make one aeroplane capable of the destruction caused by a successful attack by some 500 Lancasters in 1945. But the weapon is still a bomb, dropped from an aircraft of conventional type, operated by a human crew.

There were, however, two developments, initiated by Germany, which are bound to have a far-reaching effect on the future of air bombardment. When the Germans realized that the growing weight of Allied strategic bombing would spell defeat for them if they were unable to master it, they determined to convert practically the whole of their aircraft industry to the production of defensive fighters. The German generals, however, knew their business, and they must have felt very uneasy indeed at the prospect of having to abandon the offensive in the air. They could not fail to know that such a policy could only postpone defeat, not avert it.

Fortunately for them, two lines of scientific development offered a possible solution to their problem. One was the flying bomb, and the other the heavy rocket. Neither of these weapons required high-performance aero engines of conventional design, and neither would compete in any serious way with the resources they wished to devote to defensive aircraft. It is small wonder that they seized eagerly upon these inventions, their notorious "secret weapons," and decided to rely upon them almost completely for the conduct of an air offensive against this country.

Their plans were well laid and far-reaching. They began to build enormous structures in Belgium and the Pas de Calais, protected by reinforced concrete many metres in thickness, in which they intended to assemble and prepare the "V" weapons, and from which they meant to launch them. They planned for a huge scale of attack: some 500 flying bombs and 200 heavy rockets were to be launched daily against London and other objectives in South-East England.

[Photo: Air Ministry Crown Copyright Reserved

The V1 flying bomb immediately after launching

Our Intelligence Service got early information of this project, and our heavy bombers, by now capable of a high degree of pene-

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tration and accuracy over enemy territory, successfully struck at the great experimental station at Peenemunde, where the development work was being carried out, at the factories where the weapons were being made, and destroyed the great concrete structures in which they were to be assembled and launched. The success of this counter-offensive caused the enemy to abandon his large-scale plans and rely on small launching sites, camouflaged in woods, etc., and to use natural caves, normally used for the excellent purpose of growing mushrooms, for the storage and assembly of the weapons. This immediately reduced the threat to about one-third of its former dimensions, while a perpetual attack on the launching sites by Bomber Command and the Tactical Air Forces, and the smashing in of the caves by heavy bombers, still further reduced the scale of attack. In the event, it averaged no more than about one-tenth of the planned figures, and declined from being a dangerous threat to a serious nuisance.

Nevertheless, the attack could not be entirely stopped until the advance of the Allied armies had placed the launching sites out of range of this country.

The defeat of these "V" weapons should not, however, be misunderstood. They were defeated because they were introduced, incompletely developed and in insufficient numbers, to a situation dominated, at that time, by the heavy bombers. It is as though, as a desperate measure and at the eleventh hour, a few musketeers with brand-new weapons had been introduced by the French to the field at Crécy or Agincourt, a field dominated, at the time, by the longbowmen of England. The unhappy musketeers would have been shot through with arrows before they had a chance to affect the decision; but that is not to say that the musket, in its turn, when fully developed and when its potentialities were properly understood, would not replace the longbow in battle.

There is one other significant development, of which we must take notice. That is the development of rockets carried in aircraft, or other vehicles, capable of propelling, with a high degree of velocity and accuracy, an explosive charge equal to that of a large shell. So light is the equipment that a Hurricane was able to carry eight such rockets, propelling charges with a striking force roughly equal to the broadside of a 10,000-ton 8-inch-gun cruiser.

Thus we have four quite distinct and very important lines of future development: the flying bomb, the heavy rocket, the light rocket, and the atomic bomb. I propose to consider a little more closely the probable future trend of these four weapons, and the purposes for which, as I see it, they are likely to be used.

The flying bomb, as developed by the Germans up to the end of the last war, suffered from two major defects. First, it was too slow, and so could be caught and destroyed by our fastest fighters. This defect could be remedied by using a more powerful propulsive agent, to be paid for by increased size and weight of the weapon, or by reduced range. Secondly, it depended on a pre-set mechanism to cause it to dive to earth and explode on contact, which rendered it inaccurate at long range. In fact, less than 50 per cent. could be relied on, even if not interfered with in any way, to fall within a circle of two and a half miles' radius from the desired point of impact, at a range of 120 miles. No doubt such a mechanism is susceptible of improvement, but it must always be liable to considerable error owing to the difficulty of forecasting wind speeds, etc., along the route. The magnitude of the error will, generally speaking, be proportional to the range. In this it differs in a marked way from the humanly controlled bomber, the accuracy of which in general is dependent on many factors, of which range is by no means the most important. There seem to be two possible methods of eventually overcoming this defect. The missile can be guided from radar ground stations, much as was "Oboe" bombing in the last war, or the missiles

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themselves can be made to "home" on to the target. The first method is likely to be accurate, but, like "Oboe," it is limited to a maximum range of some 350 to 400 miles, depending on the altitude of the missile, and only one missile at a time can be handled by a pair of ground stations. Thus, both the range and the density of the attack are sharply restricted. "Homing" presents considerable difficulties, owing to the problem of identifying the target. One factory, or one built-up area, is very like another, and I doubt whether it will be possible for a long time to produce a device which will enable a flying bomb to select and "home" on to a land target. At sea, however, circumstances seem to me to be very different, and I think that "homing" on to a ship should be comparatively easy. I can imagine a flying bomb being dispatched in the known direction of an enemy ship—a great mass of metal floating on the sea—and when arriving within, say, ten miles of its objective the "homing" apparatus would come into play. The missile would be guided towards the ship, and an auxiliary rocket motor started, so that the missile would achieve a high enough velocity to ensure penetration.

Such weapons, against which all surface ships would be almost helpless, would make it impossible for warships or merchant ships of any size to approach within, say, 150 miles of enemy territory by day or night.

I think, therefore, that flying bombs are likely to be used for short-range attack of land objectives under "Oboe" or some similar control, or against shipping. Their effect, if a suitable "homing" device can be developed, on the exercise of sea power should be very great, and it is probable that all war vessels will have to be made submersible.

The heavy rocket of German "V" weapon type has a maximum range of about 200 miles. To achieve this it attains during its trajectory an altitude of some fifty miles above the earth's surface, and a peak velocity of some 4,000 miles an hour. The German rocket had a total weight of about 14 tons, of which 1,500 lb. was the explosive charge, and about 10 tons the weight of the fuel. This fuel, consisting of liquid oxygen and alcohol, had to be pumped through the burners in less than a minute. The accuracy of the weapon was about the same as that of the flying bomb at comparable ranges.

[Photo: Air Ministry Crown Copyright Reserved

The V2 long-range rocket in firing position before launching

The main characteristics of this weapon were therefore limited range, indifferent accuracy, approach at supersonic speeds allowing of little or no warning, small explosive charge and a high rate of consumption of expensive fuels.

It is difficult to see how its accuracy can be substantially improved. Nor can its range be much increased without resorting to a two-stage process, vastly increasing the size, weight and fuel consumption.

It would appear, therefore, that these rockets are suitable only for

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the attack of large targets, such as an industrial city, lying within 200 miles' range of the launching site. It will be interesting to see if the inherent disadvantages of this weapon can be overcome.

The light rocket appears to me to be a most important development, likely to have very far-reaching consequences. For aircraft, which can use them at short range, I think that they will eventually replace the gun for all purposes. As regards sea and land warfare, I am less certain; but I believe that they will prove to be a lighter, cheaper and more formidable weapon than the gun for most purposes. They are excellently suited for providing covering fire for an assault, and for laying down concentrations of fire to slow down and break up an attack. They are ideal for close-range anti-tank work, and it is possible that they will largely replace the anti-aircraft gun, especially if a rocket-driven weapon capable of "homing" on to an aircraft can be devised.

The saving, compared to a gun, in manufacturing cost, weight, ease of transportation, economy in high-grade steels and other metals is most striking. In fact, now that we have them, they seem so simple and obvious that one feels surprise that they have been so long in arriving.

As an offensive weapon for tactical air forces the light rocket is, for many purposes, superior to the bomb. For the destruction of locomotives and rolling stock, motor transport, shipping, especially the smaller and more mobile vessels, and aircraft on the ground, the rockets are much more accurate and easier to operate than bombs, and they are fully as effective. In my view, the light rocket has enormously increased the power and effectiveness of tactical air forces.

And now we come to the atomic bomb. This is a weapon of some considerable weight but of enormous destructive power. It is probable that one bomb, detonated at the optimum altitude, could devastate an area of about one square mile. In addition, it would affect by flash-burn and by radio-active poisoning all who are exposed to it within a considerable radius from the explosion.

The bomb depends for its explosive effect on a fissionable material, produced from uranium ore. The production of this material, even when the process has been commercialized, requires a tremendous effort in terms of money and man power, though probably not much greater than that required to produce its equivalent in destructive effect in conventional bombs charged with a modern high explosive. But this certainly means that atomic bombs will be precious, that no nation will have plenty of them, and that they will be carefully used, after serious consideration, against those targets which are judged to be the most vital and suitable.

The American tests at Bikini Atoll provided much valuable data as to radio-activity and blast effect, and the possibilities of decontamination. But I cannot believe that it is probable that any nation will drop atomic bombs on fleet anchorages. In fact, I will go farther and say that in an era of atomic warfare there will not be any fleet anchorages as such. The job of our Navy will be almost entirely convoy escort and anti-submarine work, requiring a large number of small ships dispersed all over the seven seas.

Important ports, vital industrial areas, and possibly centres of government and communications, will be the most probable targets for atomic bombs. The defence of such places, therefore, will be a task of the first importance. To destroy, deflect or reduce the attack would be the primary object of our active defence. For various reasons, among which is the need for great accuracy, I believe that the atomic bomb is likely to be delivered by aircraft operated by a human crew, equipped with the latest radar navigational and bombing aids.

The potential threat is so great that we must harness all available scientific

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knowledge and research to the task of improving our air defence. But some attacks are certain to succeed, and we must organize an effective civil defence to minimize the disaster if it should come. There is very much to be done in this direction. The appalling death roll in the Japanese cities was largely due to the fact that no air-raid precautions were in force. At Hiroshima the streets were thronged with people who supposed that the two American aircraft high overhead were engaged in photographic reconnaissance. No warning was sounded, and no one took cover. It has been calculated that protection such as London possessed by the end of the last war, and ten minutes' warning, would have reduced the death roll from 70,000 to about 7,000. So it is a very serious mistake to think that, because the destructive power of the bomb is so great, no shelter and no precautions are of avail. The reverse is true. The killing power of the bomb against unprotected people in the open is tremendous, but quite a small degree of protection secures immunity from flash-burn and radio-active poisoning, except for those very close to the point directly beneath the explosion. Next to that, the provision of properly equipped rescue squads for the purpose of freeing people trapped under collapsed buildings will be a big factor in saving life.

To sum up, I believe that atomic bombs are likely to be used in a carefully worked-out plan, calculated to destroy at the outset the war potential of an enemy, and to bring about the collapse of civil administration. If the attack should fail, the supply of atomic bombs is not likely to be sufficient to permit of its being repeated, except after a long interval measured, perhaps, in years.

What all this amounts to is that air bombardment with atom bombs, flying bombs and rockets is now capable of such far-reaching effects that an aggressor, especially against a country such as ours, is almost certain to attempt a knock-out blow from the air. London is an obvious target for such an attack, particularly if an aggressor can obtain control of the Low Countries and the Pas de Calais, enabling him to use flying bombs and rockets. Only if such an attack should fail will the safeguarding of our sea communications or overseas bases have any significance. Therefore, although navies and armies are not rendered obsolete by the developments in air bombardment, they will not come seriously into action in their own spheres until the first clash in the air is over. Indeed, land and sea forces will tend to be drawn, directly and indirectly, into the support of the air battle in every way open to them.

Once this battle is decided, the first phase will be over. If the blow has failed it will then be necessary to plan the second phase, which must culminate in victory. The plan will, of course, depend upon the circumstances, but the offensive in the air must be developed first. It is only when the enemy is beaten and thrown on to the defensive in the air that we can hope to take the offensive by land and sea.

This, then, is the future as I see it. On the Air Force and on its ancillary services will depend the defeat of the enemy's all-out air attacks, aimed at paralysing us at the outset. On it also will depend the development of a successful air offensive, which alone can open the way for the joint air, land and sea offensive that will lead to victory.

This is no small responsibility for the junior of the three fighting Services. There is, however, no escape from it, and it must be fully recognized both by those serving in the Royal Air Force and by those outside it. For thus, and thus alone, can we hope to ward off the blow if it should be struck, and bring about the conditions that will enable us to regain the offensive.

It will be "Per ardua ad astra" indeed.

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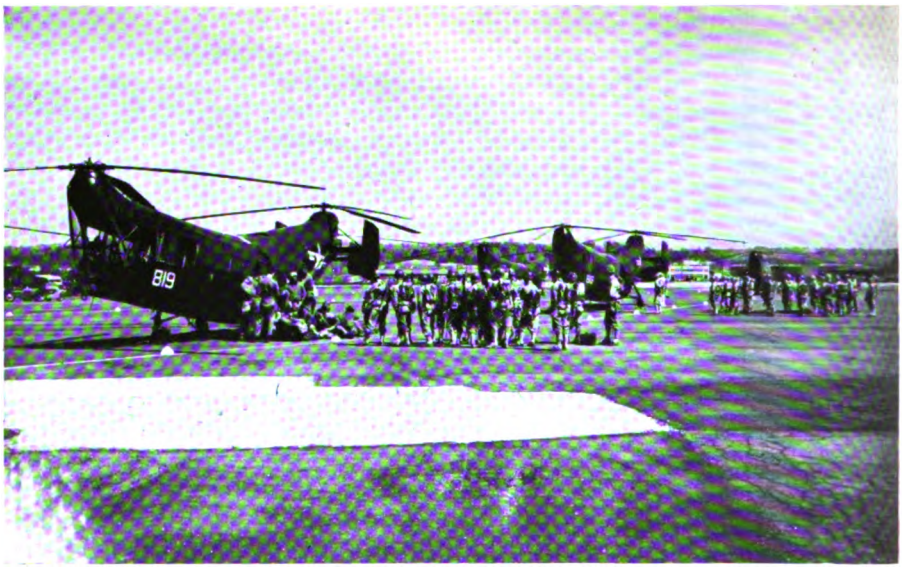

Combat marines waiting to board helicopters about to demonstrate a helicopter-borne raid from a carrier to a simulated enemy objective ashore

Marine Piasecki HRP-1 helicopter delivering 75-mm. pack howitzer to combat platoon in the field during demonstration of airborne raid by helicopter. The helicopters took off with their troops and howitzers from a simulated carrier deck painted on the flight strip

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MILITARY APPLICATIONS OF THE HELICOPTER

By John W. R. Taylor

THE helicopter is both the oldest and the newest form of flying machine. Chinese craftsmen made rotating-wing toys thousands of years ago: Leonardo da Vinci designed a primitive helicopter in the fifteenth century, and several full-sized helicopters were built before Bleriot flew the Channel in 1909—but none of them would fly. As a result, rotating wings were abandoned in favour of fixed wings, except by a few staunch supporters who believed that helicopters were both practical and potentially safer than conventional aeroplanes.

Important progress was made by Juan de la Cierva in the 1920's, when he built his autogiro—an aircraft with a freely rotating "wing" turned by airflow passing over it in forward flight. Unfortunately, although it would fly slowly, and could be operated from fairly restricted spaces, the autogiro could not hover or land and take off vertically. To do those things the engine-driven rotor of a helicopter is essential.

So it was not until 1937, when Professor Henrich Focke demonstrated his twin-rotor Type F261 in Berlin, that the first practical helicopter appeared. Three years later an even more significant development was the first flight of Igor Sikorsky's VS-300 at Stratford, Connecticut, for this single-rotor helicopter provided the basis for most of our present successful types. In 1940, however, few people could foresee much future for his strange contraption of steel tube and canvas; and this scepticism was not altogether unjustified, as the VS-300 could lift very little payload, was difficult to fly and vibrated like a tuning-fork. Yet, in the nine years since it made its first hop, other Sikorsky helicopters developed from the VS-300 have proved their worth in thousands of hours of flying all over the world.

The speed with which the helicopter has been evolved from an experimental novelty to a useful aircraft is probably due to the fact that the Second World War had already started when the VS-300 appeared on the scene. Despite its obvious limitations, the United States Government was persuaded to finance its development as a potential war machine. But for that, progress could not have been so rapid, for it has cost millions of pounds to bring helicopters to their present state of efficiency.

Even today, a typical four-seater costs about £20,000, so that helicopters are economically out of the question for commercial transport work. But economics are secondary to usefulness in military planning, a fact which is well appreciated in the United States, where helicopters are already operating in considerable numbers with the U.S. Air Force, Army, Navy and Coast Guard Services. A few are in service in Britain, but one cannot help feeling that our military planners are dabbling with them, trying to fit helicopters into their existing plans rather than amending those plans to make use of the tremendous new possibilities opened up by these unorthodox aircraft.

HELICOPTERS WITH THE NAVY

In view of the gravity of the Battle of the Atlantic in 1943, it is not surprising that when the first production Sikorsky YR-4's became available early in that

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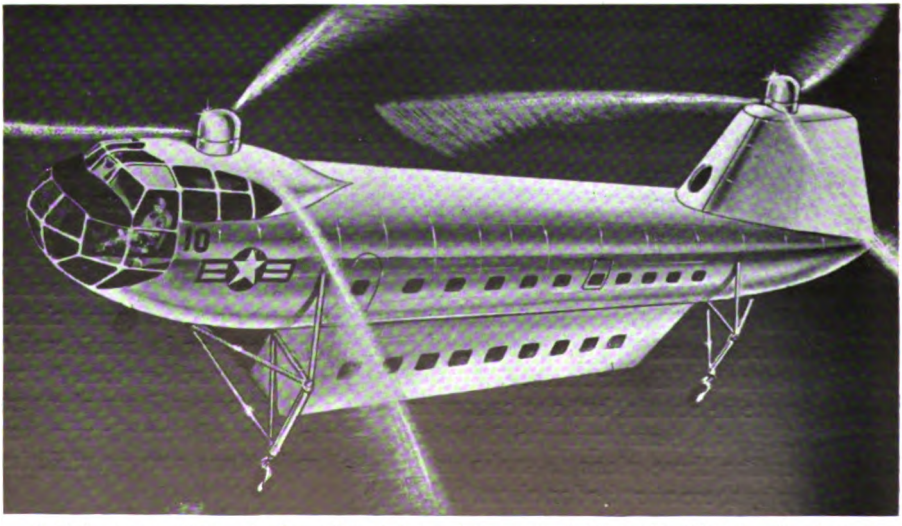
Helicopter rescues pilot hurt in bail-out. From a swamp, in which his aircraft was wrecked, the injured pilot, on an improvised stretcher, was conveyed up to the hovering helicopter HRP-1. Flown to a waiting ambulance at an aerodrome, he was conveyed with no loss of time to hospital. The doctors credit this pilot's speedy recovery to the rapid helicopter rescue



Artist's conception of the all-metal tandem-rotored Piasecki XH-16, the largest helicopter ever to be built. As big as a C-54 airliner, it can transport great numbers of men, their equipment and supplies, or evacuate the wounded from places remote and inaccessible to other forms of rescue. Two prototypes will be ready for the U.S.A.F. within the next two years

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year one of them was used to test the suitability of helicopters for anti-submarine work. Light bombs were fitted under its fuselage and dropped on to targets on land, with varying success. Later, many landings and take-offs were made from a tanker sailing at 16 knots into and across a 20-m.p.h. wind. Results were satisfactory, despite the fact that the flight deck was only 14 feet bigger than the aircraft's rotor diameter.

These trials clearly indicated that flying helicopters from vessels at sea, in reasonable weather, presented few problems. Maintenance was, however, more of a headache, and that, combined with slow rate of production of both helicopters and pilots, prevented operational use of American helicopters at sea during the war. Had they been available, their usefulness would have been limited, as they would have been an easy target for the gunners of any U-boat which decided to fight it out on the surface.

Nevertheless, the fact that helicopters can be operated at sea was not forgotten and, when the improved Sikorsky R-5 came along, the U.S. Navy ordered a batch of them for their Pacific Fleet. They have acquitted themselves so well that, last year, enthusiastic Press reports claimed that helicopters will gradually replace destroyers for many naval duties, including mail delivery between ships, transfer of personnel, especially doctors, from one vessel to another, and rescue work. In particular, helicopters will in future often replace the destroyers which cruise along behind aircraft carriers during flying operations to pick up ditched aircrews. This is undoubtedly a great step forward, as they can hover a few feet above an aircraft within seconds of its hitting the sea, whereas rescue by destroyer was always a tricky and dangerous business.

America was not the only country to develop military helicopters during the war; the Germans, for example, got as far as taking small rotating-wing aircraft to sea on board their U-boats. These Focke-Achgelis Fa.330's were single-seat autogiro gliders, but a powered version of the same basic idea existed in the shape of the Doblhoff helicopter. The Fa.330's were normally flown as kites, being towed by cable and winch behind their parent submarine, to which they were also linked by telephone. The idea was to provide an elevated observation platform to increase the submarine's field of search when cruising on the surface. The possibilities of such a scheme are obvious, as U-boats could shadow Allied convoys without being seen themselves, the small size of the rotor-kite making it virtually invisible from a distance.

An eventual production of up to four hundred aircraft a month was intended, but this idea was scotched when nearly all production Fa.223's were destroyed during Allied air raids in 1942 and 1944.

ARMY CO-OPERATION HELICOPTERS

Those are likely to be the limits of the helicopter's operational role at sea for the next few years at least; but it will probably play a much more important part in any future land operations. General Clifton B. Cates, U.S. Marine Commandant, said recently that, "combined with such things as the troop-carrying submarine, the helicopter will, I believe, become the spearhead of amphibious warfare." This may seem a little optimistic at the present stage of development, but the U.S. Marines have gone into the question very thoroughly, proving in recent realistic exercises that ten-seat helicopters, like the Piasecki HRP-1, have tremendous possibilities for such work.

The chief reason for this is that the atomic bomb has made large concentrations of ships extremely vulnerable to attack. The only answer is dispersal, which is not possible in a normal amphibious operation, as landing barges must

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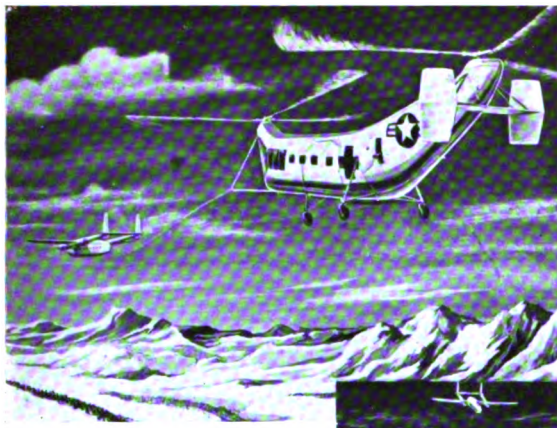
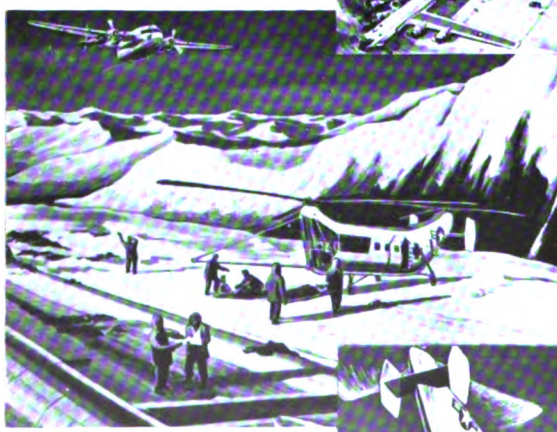


Arctic rescue. This, a polar-conscious Air Force, is of extreme importance today

Cold, remoteness and inaccessibility must be overcome. The helicopter would be towed, with idle engines, to the scene of rescue, where it lands under its own power



The HRP-1 can rescue eight ambulance patients and crew of two, or any normal crew of a bomber

Taking off under its own power, it picks up the tow again and returns to base

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start from ships anchored close inshore. But by putting assault troops on board dispersed carriers and dispatching them in helicopters at night from forty miles out to sea, the invasion force could not be wiped out by a single atom bomb. Moreover, assault troops could be landed anywhere, not just where the beach is favourable.

In recent exercises Marine HRP-1 helicopters have been flown in to a beach-head at 50 feet, covered by ground-strafing and smoke-laying jet fighters. Later waves of HRP-1's brought in 75-mm. howitzers and supplies and took off "wounded" men, while others carried in an air controller and laid wire between his advanced position and the howitzers. In every case the operations were completed quickly and efficiently.

As a result, despite the helicopter's comparatively slow speed and the vulnerability of its rotors to damage by shell splinters, the Marines believe that losses in such assaults would be considerably less than those experienced in seaborne landing operations during the Second World War.

Nor is the 75-mm. gun the biggest item of equipment that will be handled by military helicopters within the next few years, for both Britain and America are developing large "flying crane" types capable of carrying heavy loads for short distances, including such jobs as transporting tanks across rivers and hoisting bridge girders into place.

First of them is the British Merlin-powered Cierva Air Horse, the largest helicopter yet flown anywhere, which can carry loads of up to three tons. But the general impression in this country is that this type of helicopter will reach its maximum efficiency only when powered by jet engines, in the design of which Britain has a two-year lead over the rest of the world. Reasons for this opinion include the much lower power/weight ratio of jets compared with piston engines, reduced maintenance requirements and the fact that kerosene fuel burned by jets is cheaper and safer to use than petrol.

Jet power will be applied in most cases by means of small combustion chambers at the end of each rotor blade—a device first used by the Germans on their Doblhoff baby helicopters. The American Hughes Company is now reported to have begun work on a very large tank-transporter helicopter with this type of rotor, and which will consist simply of a floorless, box-shaped fuselage, surmounted by a jet rotor and flight deck. The idea is that it will hover over a tank, which will then be lifted up into the "box" by built-in hoists and flown off to its destination over rivers, mountains and any other obstacles, in support of ground operations.

A different type of large helicopter is being completed by the Piasecki Company. Designated the Type XH-16, it will have a fuselage as big as a four-engined Skymaster transport, and will carry a very large payload internally and in a pannier slung under its belly. These detachable panniers are particularly useful, as they can be loaded while the machine is airborne and changed within minutes of its landing. The saving in loading time is the equivalent of using about twice the number of aircraft.

Smaller helicopters have their uses as army co-operation aircraft, for supply and communications work, pipe- and cable-laying in rough country, artillery spotting and, of course, casualty evacuation. Sikorsky's R-4's saw service as ambulance aircraft during the recent war in Burma and elsewhere, their ability to alight and take off from small jungle clearings enabling them to serve areas where no ordinary ambulance or aircraft could operate.

Despite the fact that stretchers had to be carried externally during such missions, results were highly encouraging, and there is a record of one case where

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a person with a broken neck was successfully evacuated from a swamp area. Helicopters like the new Fairey Gyrodyne will be even more satisfactory, as they will be able to carry their stretchers and an attendant inside their spacious cabin.

Helicopters can help the radio engineers too. In fact, the Germans foresaw a use for captive helicopters as mobile aerial masts as early as the 1914-18 war. Their A.E.G. Company developed a pilotless captive helicopter to carry field aerials up to 3,250 feet in 1944, but it was a clumsy affair, requiring a heavy lorry to carry it around. So it was not until two Americans designed a small, electrically operated, pilotless helicopter last year that the "flying radio mast" idea began to look practical.

While on the subject of radio, it is worth recalling that Cierva autogiros were used during the war for radar calibration work, their slow, smooth flying characteristics ideally suiting them for the job. From this it is not hard to visualize the day when a battle commander will be able to watch the progress of an attack, in his headquarters, through the medium of mobile television cameras carried by patrolling helicopters.

AIR FORCE APPLICATIONS

Apart from supply and communications duties, rescue work will continue to be one of the most important of the helicopter's duties with the Air Force, especially if any future campaign is fought in the Polar regions. Aircrew are infinitely more valuable than aircraft, and a machine which can rescue crashed airmen as easily from an icefloe as a jungle clearing is obviously of inestimable value.

New techniques are being developed in America to overcome the problem of a helicopter's short range for rescue missions. For instance, the U.S.A.F. has made progress with a scheme to tow a Piasecki HRP-1 helicopter, with its engine switched off and rotors auto-rotating like the rotor of an autogiro, behind a bomber or transport plane, so extending its range to that of the tow plane. The procedure is that, on arrival over the wrecked aircraft, the helicopter's engine would be restarted, the tow line cast off and the helicopter landed. If possible, casualties would then be ferried to a nearby hospital centre, but if there were not one within the helicopter's flying range it would take off with the casualties on board and re-engage its tow with the aid of a rocket line, so that it could be towed back to its base. This procedure calls for a high degree of flying skill, but it is possible and could be the means of saving many lives that would otherwise be lost.

Looking beyond these present-day applications of the helicopter, a possible glimpse of the future is given by an unorthodox helicopter-fighter design produced in Germany during the war by the Focke-Wulf Company. Instead of a normal rotor mounted above its fuselage, this project had a three-bladed jet-type rotor which turned axially around an otherwise normal fuselage. For take-off the aircraft was intended to stand vertically on wheels built into its tail, the idea being that it would climb rapidly to its operating height and there level out into horizontal flight, with the rotor still turning around the fuselage to provide lift as well as thrust. Focke-Wulf estimated that this aircraft would have a top speed of 620 m.p.h. and a range of 1,100 miles at 36,000 feet, with full military load. If this seems a little like a Jules Verne fantasy, it is well to remember that so did jet-propulsion a few years ago, and that Focke-Wulf built some of the best fighters of the Second World War.

(Concluded on page 131)

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THE PART OF STRATEGIC BOMBING IN MODERN WAR

By Wing Commander W. P. Whitworth, A.F.C.

Introduction

DEFINITION OF TERMS

IT is the purpose of this article to discuss, in the light of events since the First World War, what part strategic bombing should play in modern war, but before going into detail on this subject it is advisable to explain the exact meanings attached to the terms and words employed. Therefore the following definitions will apply:

Strategic Bombing Operations.—Those air operations whose main purpose is to deliver bombs on to an enemy target; but excluding air operations in direct support of land or sea forces.

The Object of such Operations.—To attack effectively those enemy targets whose destruction is best calculated, at the time, to undermine the enemy's power or will to continue the war.

Air Superiority.—The general war situation in which the enemy air forces are unable to interfere effectively with our own operations by land, sea or air.

Modern War.—War which may occur at the present time or within the next ten years.

STRATEGIC BOMBING OPERATIONS

Strategic bombing operations were carried out throughout the six years of the Second World War, though the conclusions drawn from the results of these operations were extremely varied and often contradictory. Since the war ended, however, it has been possible to examine these results in much greater detail and in much better perspective than was possible during the war. This examination has established several basic conclusions regarding strategic bombing and has given valuable indications as to the correct use of strategic bomber forces in modern war.

Having studied the conclusions that can be drawn from the results of strategic bombing in the last war, it will be necessary to relate them to present-day conditions, and to see in what way the basic requirements for successful bombing could be met by the types of aircraft and equipment likely to be available. This study will thus provide the final answer concerning the part that strategic bombing should play in modern war.

Lessons Learnt from the Second World War

AIR SUPERIORITY

In modern war a country needs air superiority before it can even begin to wage war successfully; and without air superiority it is useless to consider the various forms of warfare that might be employed against an enemy. This lesson was demonstrated time and again throughout the Second World War, firstly by the Germans and then by our allies and ourselves. The German method of obtaining air superiority was to attack the enemy air bases with as much surprise as possible

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and with as strong a force of bombers and fighters as could be assembled. In this way the enemy air forces were put out of action almost at once, and were kept out of action by attacks on the aircraft factories, or repeat attacks on the air bases. This method stood Germany in good stead in all her earlier campaigns; notably, in Poland, Norway and Holland; but it did not prove successful in the Battle of Britain. From that time onwards we were able to fight for the one thing that could give us final victory—time—and with time we were able, very gradually, to build up and then establish air superiority over the German air forces.

The absolutely essential requirements for air superiority, before undertaking any major campaign against a modern enemy, is the most important lesson that can be drawn from the Second World War. Whether the intended campaign is to be by land, sea or air forces is of comparatively small importance.

NATIONAL WAR EFFORT

In the last war we did not attempt to win the war with air forces alone, or even with air power as the most important means of defeating the enemy. From 1940 onwards the Cabinet certainly did give aircraft production the highest production priority, so that Bomber Command should be expanded to its greatest possible strength. But this did not give a true picture of the proportionate distribution of the national war effort. In 1940 the man power of the Army was about six times that of the R.A.F., while by 1944 the Army still had three times the numbers of the Air Force. Of the direct war effort the Army accounted for about half, while the R.A.F.'s share was nearer one-third. Again, taking into consideration all normal factors, the bomber force itself took only about 12 per cent. at its peak, and over the whole war only 7 per cent., of the direct war effort. This shows clearly that we did not attempt to use the air as the real war winner, but rather that we relied on the combined efforts of all the three Services to achieve victory.

BOMBING POLICY

Our early bombing operations against ships of the German Fleet immediately disclosed one very important fact: that is, we found that our bombers, unescorted by fighters, could not stand up to the attacks of the German fighters. We had concentrated our whole fighter production on fighter aircraft for home defence, and at that time we had no fighters that were fit for escort duties. This situation forced us to resort to night bombing and this change in policy seriously affected our bombing throughout the war. By day the pilots and bomb aimers could see the target (if they got to it), but by night the inaccuracies were tremendous; this fact was to prove a definite disadvantage to us in by far the greater proportion of our bomber operations. Further, owing to frequent changes in the war situation in the early stages, too many targets were being attacked with too small a force of bombers. Thus, in July, 1940, thirty-one oil targets were attacked, twenty of them with less than twenty tons of bombs; this was a complete waste of effort, and little or no permanent damage was done to the selected targets, though the bombs could ill be spared. Again, during the summer of 1940, 3,000 tons of bombs were distributed between eight distinct and varied target systems. Not only was our bombing effort being dispersed over too many targets, but it was also apparent that the effect of a given tonnage of our bombs had been overrated by the experts concerned. A further point was that our standard of navigation and target recognition at night was so poor that it was useless to expect our bombing (except by moonlight) to have any success against small targets. This led directly to the selection of larger targets ("area" targets, as they were called) so that we would have targets capable of attack by our bombers throughout the hours of

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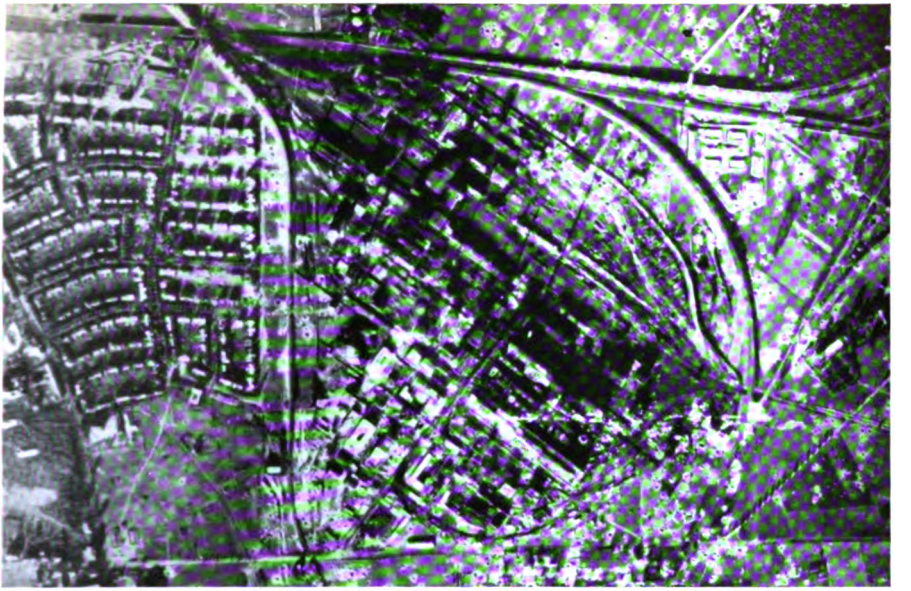

Photo of Meerbeck/Rheinpreussen oil refinery. Example of profitable target. This important oil refinery was attacked on many occasions, but was, in fact, put out of action in one bombing raid

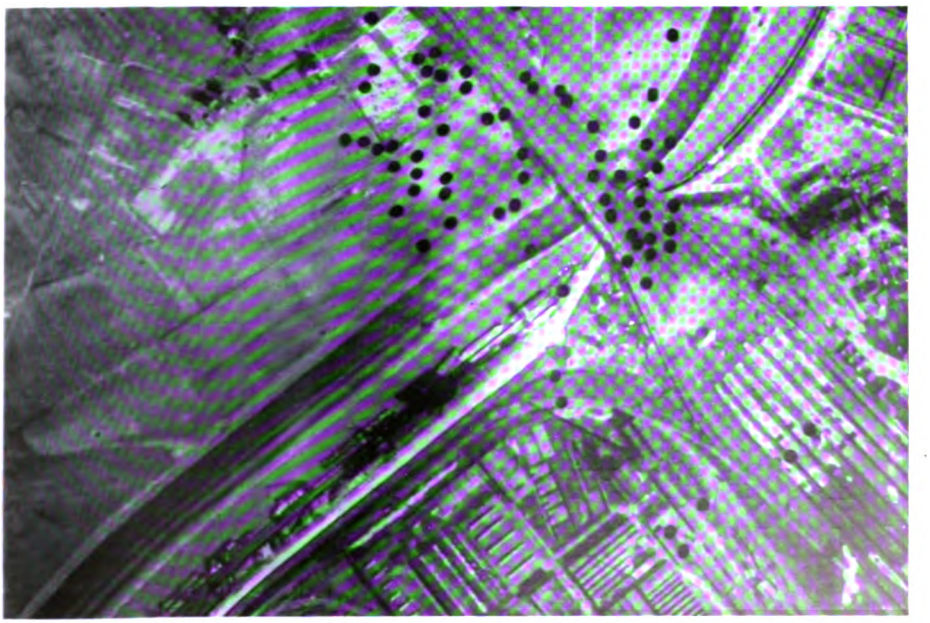

Photo of Hamm marshalling yard. Example of a profitable target. The bomb plot of a raid against a vital transport target, where a multi-track railway passes over a river and a canal

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darkness—particularly as the German night defences had caused heavy casualties among our night-bomber aircraft.

The operational necessity for "area" bombing was not in itself the only reason for the adoption of this policy, since it was considered by our economic experts that the German economy was stretched to its limit, and that any general chaos caused to German industry would also adversely affect the direct war industries. It was also considered that attacks on the urban areas of industrial towns would not only render thousands of workers homeless and lower their morale, but would incidentally cause great damage to industrial plants, power services, public transport services, etc. In this way it was hoped to reduce the total German output of armaments by as much as one-third. It is now known that this assessment was wholly inaccurate, in that the morale of the homeless workers remained extremely high under the worst possible conditions, and the output of armaments in Germany rose steadily throughout the war until the latter part of 1944.

The devastation, over a period of more than three years, of all the major German cities and industrial areas, on the false assessments of economic experts backed by military leaders, must be classed as one of the most serious blunders of the Second World War. Admittedly, huge defences were organized and continuously employed by the enemy, at a great cost in man power and materials, but the fundamental error in the selection of "area" bombing as the role for our strategic bombers is undeniable.

BOMBING ACCURACY

Bombing is dependent on accuracy for its effectiveness; without a certain degree of accuracy it is useless, no matter how efficient the particular type of bomb. It is therefore instructive to discover what degree of accuracy is considered acceptable, and what is not, for strategic bombing. From a study of the detailed results of bombing during the Second World War it is possible to draw the following general conclusions:

Night Bombing by a Main Bomber Force.—This was the type of bombing in general use by the R.A.F., and was normally carried out from 15,000 to 20,000 feet. It was capable of devastating vast areas within cities, but it was unsuitable and extremely wasteful against small, isolated targets. Accuracy of bombing was at first very poor, but by 1944 the average error of such attacks could be taken as 500 to 700 yards from the centre of the target. This type of bombing could be carried out in all but the worst weather, using target-marker bombs to indicate the target.

Day Bombing by a Main Bomber Force with Fighter Escort.—This type of bombing was used extensively by the American air forces and occasionally by the R.A.F. Visual identification of the target was essential, and accuracy was very similar to that of night "area" bombing, i.e., 500 to 700 yards from the centre of the target. The success of such attacks was entirely dependent on the weather.

Day or Night Precision Bombing.—This bombing required specially trained squadrons, who normally attacked from 15,000 to 20,000 feet with an extremely accurate bombsight. An average error of 150 yards from the centre of the target was obtained, and highly successful attacks were made on small, isolated targets, though good weather was essential for these attacks.

Day Bombing at Low Level.—This bombing required specially trained squadrons and was used only against selected targets of importance. Bomb-

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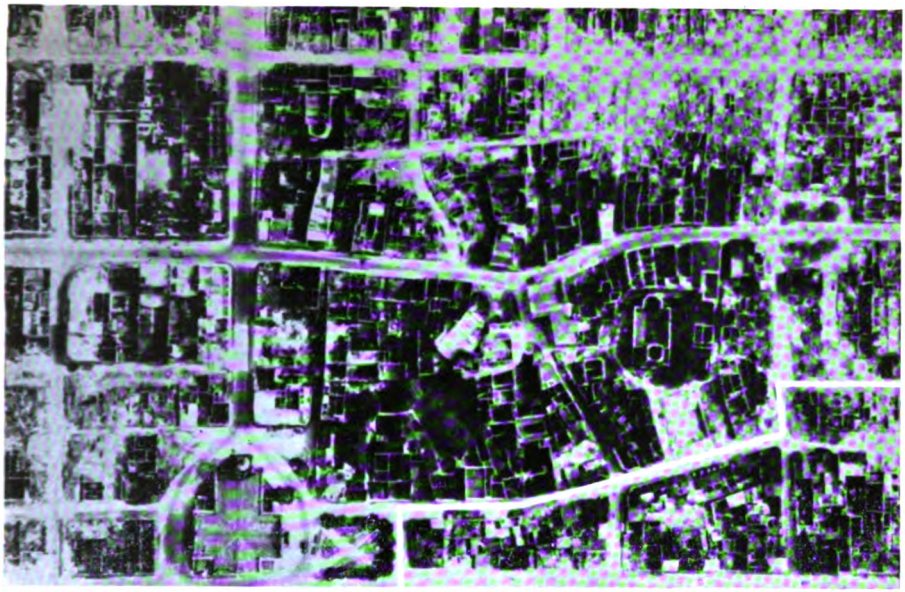

Photo of Krefeld. Example of wasteful bombing. This type of "area" attack was devastating to the towns and cities concerned, but such attacks did little to reduce the overall industrial output of Germany

ing was from very low altitude (100 to 200 feet) and the average error was less than 100 yards from the target.

The basic conclusions that can be drawn from the above information are as follows:

(*a*) Bombing with an average accuracy of 500 to 700 yards is capable of devastating vast areas within cities, but it is extremely wasteful and inefficient when bombing individual targets such as factories or industrial plants. Moreover, since the general devastation of cities and industrial areas has proved to be of little value as a means of waging war, a bombing accuracy of 500 to 700 yards is not acceptable for strategic bombing.

(*b*) Bombing with an average accuracy of 150 yards is effective against all normal targets, and is acceptable as the average accuracy necessary for the successful operation of a strategic bombing force.

(*c*) An average accuracy somewhere between 150 and 500 yards may be acceptable for strategic bombers when attacking certain very large targets.

CONCENTRATION ON SELECTED TARGETS

In the early stages of the Second World War we have seen that the mistake was made of attacking too many different targets with too few aircraft (see under "Bombing Policy"). But by the later stages of the war (1943) this mistake was appreciated and much more detailed analysis of target systems was undertaken, and attacks on the selected targets were much more concentrated. If this lesson had been learnt earlier it is doubtful if it would have made a great deal of difference to the course of the war, as in the early stages our bomber force was so small that it really was not fit to undertake the destruction of even a few selected target systems.

Nevertheless, it was an important factor in bombing, and towards the end of

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the war we were able to implement this policy with marked success. By the end of 1943 a very complete analysis had been made of the effects of our bombing on the main railway centres in Italy and Sicily, and this showed that a comparatively small number of attacks on the vital centres had all but paralysed the whole rail system. We therefore made a similar but much larger plan for the attack of communications in Northern France, as a prelude to our invasion of the Continent. Attacks were to be made on all important railway centres (seventy-nine of them in Northern France and Belgium) with the object of disrupting and destroying the rail communications which would be so necessary to the Germans in the event of our invasion. These attacks went on for nearly three months (from March, 1944, until just prior to the invasion) and in that time they had achieved their object; the railways between Germany and the invasion coast were in a state of complete disruption and paralysis.

At this stage of the war another German target system, which had been methodically analysed from the start of the war, gave indications that it was vital tc Germany's war effort, and was also vulnerable to our bombing attacks. This was oil; or, more correctly, the synthetic-oil plants. Germany had exhausted her captured stocks and was relying almost completely on the output of her synthetic plants; we therefore undertook the systematic destruction of these plants wherever they could be found. It was a ruthless and continuous attack, with a single object in view—to deny the enemy the use of an essential product for continuing the war. The strategic bombers were concentrated on this task, to the exclusion of all but a few important diversionary attacks, and the results were as striking as they had been with the attacks on railways in Northern France and Belgium. Germany was starved of her vital supplies of oil, and there is no doubt that in due course she would have been forced to cease taking part in the war, without regard to the state of her armed forces or of her internal economy—without oil they were useless assets.

Strategic Bombing in Modern War

Air superiority is an essential factor in modern times if a successful war is to be waged by land, sea or air. Therefore, whatever part strategic bombing should play in war, air superiority must be established as soon as possible after the outbreak of hostilities. Assuming that this can be done, the requirements and potentialities of a modern strategic bombing force will be examined in the succeeding paragraphs.

BOMBING POLICY

In modern war the aggressor is unlikely to give any warning of his intended attack on an enemy, and therefore the strategic bombing policy of any nation must be determined in peace time. Further, a bomber force should be held in readiness to implement the policy as and when required. Before the bombing policy can be decided, however, a vast amount of information is necessary concerning the internal economy of all likely aggressors. This information must be studied and analysed by the most able scientific and economic experts available, so as to discover a weak spot or flaw in the general economy of each aggressor country. This weak spot should preferably be some raw material or commodity which requires specialized production in only a few centres, but which is essential for continuing the war. Obviously whatever vital targets are chosen, they must be suitable targets for air attack. If the analysis of every type of industry and activity within a country is based on reliable and up-to-date information, it is almost certain that one weak but vital point will be found. Where this is the case, strategic

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bombing should be used as the main method of defeating that country in war. Where no such vital point can be found in a country's economic and industrial life, strategic bombing certainly should not play a major part in the war against that country.

LIMITATIONS OF A MODERN BOMBER FORCE

Having found and selected targets which are vital to the enemy's war effort, it is necessary for strategic bombers to be able to reach those targets, identify them, and destroy them. The capabilities in this respect of bombers of the last war are known; they had a radius of action of less than 1,000 miles with a good bomb load; today the strategic bombers may require a radius of action of 2,000 miles to play their part in modern war. They will also require expert navigation over long distances, an average bombing accuracy which will give them a reasonable chance of hitting the target, and they must be capable of carrying a bomb load which can destroy or seriously damage the target attacked. Results of "area" bombing in the last war showed that the accuracy obtained in these attacks (500 to 700 yards average error from the centre of the target) was extremely wasteful against normal targets such as industrial works or factories; and the targets that are selected in this case may of necessity be small and isolated. Therefore, bombing errors should be as small as possible, and in any case not greater than 500 yards from the centre of the target. With the modern jet bombers operating at heights of 40,000 feet or higher, at speeds of 400 knots or faster, everything is against accurate bombing from these bombers in a strategic bomber role.

Visual bombing, in which the bomb aimer actually sees the target, offers the greatest accuracy at present, but this type of bomb-sighting has the inherent disadvantage that it is dependent on the weather, which, on the average, is fit in only four or five days each month. This would be a most serious handicap to the use of any bomber force, and particularly so when the greatest urgency for bombing operations may well be in the first month or two of a war.

The inability to bomb accurately is therefore likely to be one of the most serious factors which must be considered when determining the correct role of the strategic bomber. If accuracy is better than 500 yards, then it is certainly worth attacking industrial targets of a reasonable size; but if accuracy is worse than 1,000 yards, it is doubtful if any use can be found for a strategic bomber force in modern war.

ATOMIC BOMBS

The effects of conventional bombs are well known, but it is possible that strategic bombers will carry atom bombs instead. Atom bombs are, however, extremely costly and unless the stocks of atom bombs available in reserve, or manufactured during a war, are sufficient to ensure the complete defeat of the enemy, conventional bombs will be required to supplement the atomic attacks. The great difference in using atom bombs is likely to be that colossal damage can be caused in a short time; and it may therefore be possible to paralyse and defeat an enemy in a matter of days. Otherwise, atom bombs do not alter the role that should be allotted to strategic bombers; their object is always to find and destroy the vital targets of the enemy; and the same accuracy is required for atom bombs as for the normal types.

CHEMICAL AND BACTERIAL WARFARE

A strategic bomber force may be used as the means of carrying chemical or bacterial warfare into the heart of the enemy country. Where an aggressor

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possesses one or more of these types of weapons of mass destruction, and is prepared to use them ruthlessly against an enemy, the strategic bomber force will play the major role in waging this type of warfare.

Conclusions

The basic lessons that can be drawn from the results of the last war indicate that strategic bombing, in itself, could be a decisive winning factor in modern war. But to achieve this object by means of strategic bombing, any country would have to ensure that the following requirements were fulfilled:

(*a*) The establishment and maintenance of air superiority over the enemy.
(*b*) The possession of sufficient intelligence information about likely aggressor countries to enable a vital weak spot to be found in the internal economy of such countries. (This weak spot to consist of targets which are suitable for air attack.)
(*c*) The possession of a strategic bomber force capable of reaching the enemy's vital targets, finding them and destroying them.
(*d*) The ability to continue attacks against the enemy's vital targets until the enemy ceases to wage war.

At the present time, general indications are that no countries could meet the above requirements fully; therefore, unless a country took steps to remedy its shortcomings in this respect it could not rely on strategic bombing as a war-winning factor. The preparation and planning necessary to establish an efficient bombing force are a heavy commitment on any country; yet without an efficient bomber force a country is unlikely to be able to wage war successfully against an aggressor who has such a force. With modern weapons a well-planned strategic bomber attack offers the chance of a quick victory to the aggressor, as it may well be too late for the country that is attacked to prepare its own offensive. Therefore, for a country which intends to be aggressive, strategic bombing should play the major part in all offensive operations.

The countries which do not intend aggression (including most democracies) are not in the same position as those that do intend it. The former normally cannot afford vast expenditure on preparations for war, and their general policy is more one of defence than offence; thus they are unlikely to possess an efficient strategic bomber force. This is a most dangerous position for the non-aggressor countries, and it can be remedied in only two ways. Either they must face up to the threat of a strategic bomber offensive from an aggressor country, by building up an efficient bomber force of their own; or they must prepare some other plan of defence against the enemy bombers, and relegate their bomber force to a minor role in this plan. They will be wise to choose the former alternative, since there is no counter-measure which will prevent an efficient bomber force from achieving its object.

Strategic bombing is therefore destined to play the most important part in modern war; it is the most devastating form of aggression; and the only real defence to it is retaliation on the aggressor by his own methods.

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CLOSE AIR SUPPORT AND SOME POPULAR DELUSIONS THEREOF

A Commentary

BY "AQUILA"

ANY man who seeks to undermine the mutual understanding and comradeship between the three Services and to hinder the due application of all appropriate techniques of war towards the single aim of developing our best fighting efficiency is an enemy of the State. But he who would seek to throw a true perspective upon the many and often intricate combinations of all known techniques of war is contributing to the mutual understanding between the Services primarily responsible for those techniques. It is in this spirit that this commentary is written upon the article under the above title which appeared in the June number of *The Fighting Forces*. While no attempt can be made in a short article to present a comprehensively reframed point of view, it is hoped that the reader will reconstruct from these isolated comments a fair picture of the problems of air support.

The implication which the Press outcry about air support in the *Amethyst* incident surely embodied was far more than the idea that the supporting aircraft would be able to eliminate at a stroke the weapons which were able to attack our warships. First, there is the question of air superiority, and the ability to ensure that foreign aircraft could not add their weight to the attack against our ships. Had the foreign power not set a limited aim for itself, that of trapping a unit which had no aggressive purpose, there is little doubt that the *Amethyst* could have and probably would have been sunk by air action. Second, had our ships expected a hostile attack whilst on their lawful duty, steps should have been taken to provide this cover. On the other hand, the lawful mission of the *Amethyst* might have been compromised by the presence of aircraft, which might have been deemed by the foreign power to be a challenge and in excess of the fighting power required for the particular duties involved. Third, had adequate provision been made for air support it would at least have constituted a further deterrent to the action taken by the foreign power. Nevertheless, the answer to the Press outcry surely lies in the aim which the Government set for itself. This was necessarily dependent upon a mixture of political and Service factors. It was clearly no part of our policy to provoke an attack!

Any notion that the aircraft is all-powerful in the land battle as such is certainly not held by either army, air force or, for that matter, naval officers; nor is there any doctrine or instructed thought to this effect. On the other hand, a system was worked out during the last war which allowed aircraft to give of their best on the battlefield when by joint agreement between the land and air commanders it was practicable and desirable to concentrate their fire power at the critical time and place. The soldiers have certainly learnt that the airmen were right to oppose the production of dive-bombers of the Stuka variety at a stage in the war when air superiority was in doubt. The subsequent adaptation of the high-performance fighter to the ground-attack role proved in fact to be the most economical and efficient expedient to reconcile the problems of air and land warfare.

Army commanders have not been sold any "myth" as to the effect of aircraft

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in the tactical land battle. Surely it was the airmen themselves who pointed out that of all targets within the range of aircraft, the isolated infantryman on the battlefield, camouflaged, dug in, dispersed and concealed from the air, is the most difficult and the most unrewarding target from the air point of view. Nevertheless, this does not mean that the airmen seek to resist the use of aircraft in the land battle, if and when they can be released from the air battle, to assist the soldier against enemy opposition, even though the only practical effect may be to keep the enemy's heads down, and, perhaps more important, to stimulate our own troops.

It is true that it is difficult to see an army deployed for battle from the air. This is especially true in jungle warfare, but very much less so in desert warfare. From some points of view, an army officer may be better equipped to identify enemy troops and fighting vehicles, but most soldiers realize that a different perspective presents itself from the air. The very difficulties make it easier for one who is familiar with the air perspective to identify detail on the ground than it is for one who is familiar with the ground perspective. However, it is the airman who must make the attacks against ground positions, and it is therefore necessary to train him in the identification of enemy equipment and in the methods and needs of the army. This is in fact what is done in air forces providing tactical support to an army.

It is rather invidious to state that the army officer is assisted by "his greater knowledge of map reading." An airman will be every bit as highly trained in map reading. The difference of perspective is, however, important, and each in his own sphere is expected to be the master of his trade.

To quote incidents such as "the two hundred hungry men" is to capitalize particular mistakes . . . to associate the particular with the general. As many mistakes were made on the ground. And to suppose that the training of soldiers would serve the airmen better is to misunderstand the soldier's point of view and to underrate the airman's problem. Soldiers who fought in Burma, or in any other theatre for that matter, know well the faithful skill with which the airmen fought and contributed so much as part of a single army/air team. Indeed, few soldiers would be presumptuous enough to challenge an airman in his own element, or vice versa.

The problem of indicating targets has exercised both soldiers and airmen for many years. Probably the best answer is coloured smoke if visual aids alone are being considered. The variation in colours will help to dispel the danger of the enemy "lobbing a few smoke shells around the landscape." A combination of good briefing, high training, R/T contact, methods of remote control when available, the effective selection of bomblines in addition to target indication by coloured smoke, provide good though not perfect methods of assisting the aircraft on to the target.

However, it is erroneous to paint too gloomy a picture by the over-emphasis of some of the difficulties which must be faced and overcome by the airmen and soldiers jointly. It is also erroneous to suppose that incidents in which our aircraft attacked our own troops were numerous, or that the airmen were the only partners in the land/air battle who were to blame in every case.

And surely it is illogical to over-emphasize the difficulties of the airman at one moment, and to suggest at the next that the whole complicated organization built up to overcome these difficulties is just a piece of joint army/air eccentricity which can so easily be replaced by walkie-talkie sets and direct discussion between any aircraft and any army officer at the front. Some conflict is likely to arise between competing bidders on the ground. The frequencies are liable to

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become saturated with orders affecting all manner of weapons and units on the ground and in the air. The slenderest experience or even a moment of thought, will serve to show that the solution is not so simple.

The accuracy of air attacks depends upon the technique employed and the aircraft and weapons to be used. These must be reconciled to the type of target and the effect desired. To destroy large towns, the heavy bomber and heavy bombs are used, and what is lacked in accuracy is, broadly speaking, made up for by intensity. To destroy a pin-point target such as a single tank, the fighter, adapted to carry bombs, rockets and cannon, is used. The cannon is the most accurate, but its shells are unlikely to penetrate a heavily armoured tank. The bomb is the least accurate and is not ideal for such a task. The rocket is the best available compromise. Its accuracy and its lethal power are being increased still further, and this will make it a very effective weapon.

Detailed reports show that the accuracy of rocket fire compares very favourably with artillery fire, and in some circumstances the figures compiled from evidence in North-West Europe are in favour of the rocket. However, a straight comparison is of little value, especially if it is stated rather meaninglessly that gun fire "would at worst be several hundred times more accurate than air support at its controlled best." Naïve mischief!

The weapons available must be considered in the light of all their qualities, not of just this or that quality. Otherwise the uninitiated might argue that the advent of the atomic bomb had outdated the rifle. What is more, the cost of particular weapons and the vehicles in which they are carried must be related to all their qualities and not only one. Apropos, the airman is rather naturally more enthusiastic about attacking a ship or a train which he can do effectively with the same fire power required to attack a Bren-gun position. But all these things are weighed in the careful planning which seeks to use all weapons in their most effective and economical way and in accordance with the phase of operations.

To carry these false comparisons to the personal equation savours of the most direct attempt to break up the cohesion between the army and air force. Any thoughtful and right-minded soldier will resent the insidious and underhand implication concerning the approach of his airman colleagues to the Press, and the airmen may be assured that their brothers-in-arms are under no such delusions. Such ill-bred slights are best overlooked by a proud Service.

It is a pity that the few points of some substance in the article under discussion have been obscured by so much ignorance and acrimonious ranting. If good ideas can be put forward on this problem of direct air support, both the soldiers and the airmen will welcome them. If there is one thing which is absolutely certain it is that these problems can be solved only by soldiers and airmen together and through a close understanding of each other's needs and difficulties. To vest the discussion of joint Service problems with such an odious series of comparisons will get nobody anywhere. The soldiers and airmen together have travelled far beyond this sort of bickering since the black days when inter-Service friction was a cancerous threat to the nation's war effort.

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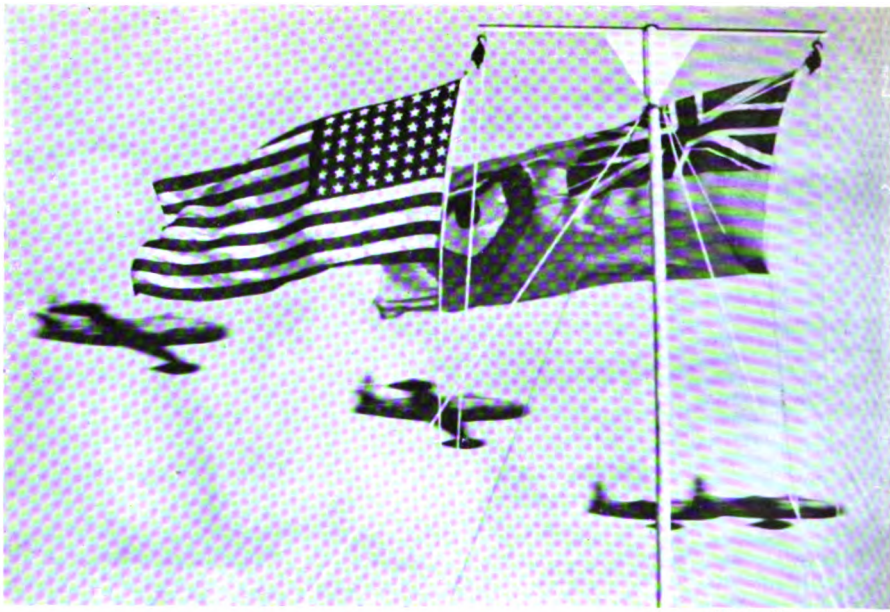
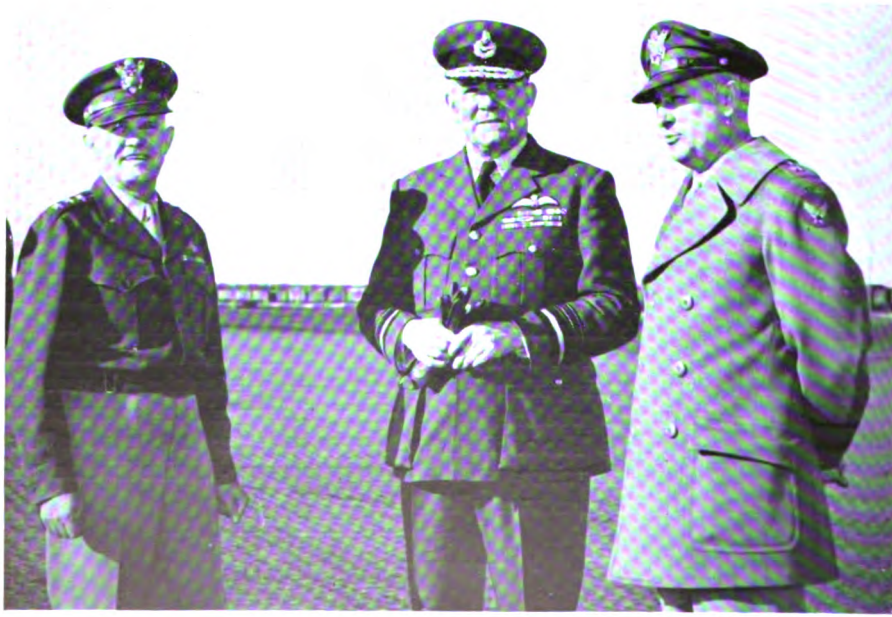


[Photo: U.S. Air Forces

Odiham, England. . . . U.S. Air Force F-80 Shooting Star jet planes fly low over this R.A.F. Fighter Command station prior to landing after the first West—East trans-Atlantic crossing by jet planes. Departing from Selfridge, Michigan, they proceeded by way of Labrador, Greenland, Ireland and Scotland



[Photo: U.S. Air Forces

Commanders of the air-lift operation meet at Fassberg R.A.F. Station, in the British Occupation Zone, while on an inspection tour of air-lift bases. (Left to right) *Lieutenant-General John K. Cannon, commanding U.S. Air Forces in Europe; Air Marshal T. M. Williams, commanding British Air Forces of Occupation; and Major-General William H. Tunner, commanding Combined Air Lift Task Force*

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UNITED STATES AIR FORCES IN EUROPE

AT the end of the Second World War the United States Air Force comprised some 17,000 aircraft and a half a million men in Europe. The organization was designated as United States Strategic Air Forces in Europe, a war-time force whose mission was simple: seek and destroy the enemy.

The present organization known as United States Air Forces in Europe is an outgrowth of the combat force which ceased operations on 16th August, 1945. It is under the command of Lieutenant-General John K. Cannon, with headquarters in Wiesbaden, Germany.

Reorganization of the large war-time force began almost immediately with the cessation of hostilities, the first missions being that of maintaining security of American interest on the war-torn Continent, demilitarization of the Luftwaffe and, at the same time, disposing of the voluminous pile of surplus equipment remaining. Simultaneously, of course, personnel strength had to be drastically reduced.

To Erding Air Force Depot, presently staffed by the 7200th Air Force Depot Wing, befell the lion's share of work in material disposition. Moving into an 80-per-cent.-destroyed Luftwaffe base in June, 1945, American forces began at once to rebuild from the wreckage one of the most extensive supply and maintenance depots now in existence on this continent. Subsequent events proved the wisdom of this planning.

The big task of recovering surplus war material was accomplished through the inauguration of tested Detroit production-line methods. Stock-piles were consolidated and all facilities centralized before the production-line screening which allowed a further breakdown. Surplus property was disposed of through sales to foreign governments and American business concerns.

This project resulted in the return to Air Force accountable property of 30,248 long tons of supplies valued at $126,886,776.00. Of the tons of material screened, 4,886 long tons were shipped to the United States, 10,546 long tons returned to stock in Germany, 499 tons directly to other air depots in Europe, 12,133 long tons salvaged, and the remaining 2,234 long tons disposed of as surplus property.

Surplus aircraft were either returned to the United States, retained in the command or disposed of to foreign governments.

The personnel problem was handled in a manner somewhat similar to that of material. Officers and airmen were screened to determine those best suited to U.S.A.F.E.'s needs and the surplus shipped home. Today a greatly reduced personnel serves the requirements of U.S.A.F.E., including the Berlin air-lift.

Primarily, U.S.A.F.E.'s mission today is to provide air support for the occupation of German as military government shall require. At the same time, over-all efficiency is maintained by extensive training so that U.S.A.F.E. may remain a representative part of the United States Air Force as a whole.

Adequate air support for the occupation requires at this time a small but hard-hitting tactical force. U.S.A.F.E.'s tactical organization falls under the 2nd Air Division, which is, in turn, directly under the Commanding General. The 2nd Air Division is being organized as a central command charged with tactical air responsibilities. A typical unit of the 2nd Air Division is the 86th Fighter Group, which is equipped with F-47 Thunderbolts. Other units are equipped with conventional engine- and jet-type aircraft.

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[Photo: U.S. Air Forces

An F-47 Thunderbolt of the 86th Fighter Wing, Neubiberg, surprises an "enemy" tank of the 2nd Armoured Cavalry during Exercise "Showers," the spring training manœuvres recently held in Germany

[Photo: U.S. Air Forces

Ground Controlled Approach (G.C.A.) units used to control Operation "Vittles," or Operation "Plainfare," as it is known to British aircraft on approach or landing at Gatow airport, are operated by personnel from both British and U.S. Air Forces. (Left to right) *Corporal William Black, Flight Lieutenant A. Green, M./Sergeant W. Kranz, Flight Lieutenant E. Attwell, Corporal E. Renshall and Aircraftman P. Stephenson*

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These tactical elements have provided support for EUCOM ground operations in past manœuvres. In the recent Operation "Showers" their task was to repel enemy aircraft attacking communications and armour behind the hostile battle lines. The same aircraft simulated strafing and dive-bombing of enemy troops, supply dumps and convoys.

Working in close liaison with infantry units, the fighters received their target orders from radio jeeps which carried pilots from their own units. These pilots directed the planes in the air to their ground targets. The effectiveness of this method of fighter employment over Germany was demonstrated in the last war.

Frequent manœuvres provide an excellent test of combat efficiency, but it is daily training, consistently carried out, that keeps an air force operating at a satisfactory level of combat readiness. Pilots and technicians of U.S.A.F.E.'s tactical units undergo constant schooling and on-the-job training with the fact in mind.

Excluding air-lift transport flying, the total aircraft flying time in any average month still runs into many thousand hours flown by fighter, administrative and reconnaissance planes. The command average for all active assigned aircraft, including Air Lift Task Force, approximates one hundred hours per month per aircraft.

In addition to the fighters, troop carrier units are maintained by U.S.A.F.E. The 60th Troop Carrier Group based at Wiesbaden is a typical organization. At the present time it is engaged in air-lift activity. When the air-lift is terminated it will resume normal operations and training.

The value of troop carrier units lies in their versatility. When not being utilized in their primary tactical mission of transporting and dropping combat troops, they are available as routine personnel carriers in air-line type operations, or, as has aptly been demonstrated, for missions such as the Berlin air-lift for which they have proved invaluable.

It is expected that troop carrier strength will be maintained at the pre-air-lift level when these operations are suspended.

A small but vitally important component of the tactical organization consists of several aircraft control and warning squadrons located throughout Germany. These units provide navigation aids for aircraft operating in the American Occupied Zone, giving position fixes and courses to various destinations.

The present tactical units, while small in number, are highly trained and are subject to rapid augmentation if necessary. The pipe-line to the United States is carefully maintained for this purpose. The Berlin air-lift indicated, to some extent, the effectiveness of this lifeline across the sea.

The Russian land blockade of Berlin posed a real challenge to the limited military air transport available to U.S.A.F.E. last summer. The Theatre Commander directed U.S.A.F.E. to initiate air-lift operations in June, 1948, on 26th June the first scheduled Berlin flight by C-47 Dakotas began with twenty-five sorties carrying eighty tons of food and supplies into the blockaded capital.

The Air Lift Task Force was organized and began to operate almost immediately thereafter under the temporary command of Brigadier-General Joseph Smith. R.A.F. operations began from the British Occupied Zone within a short time, and on 28th July Major-General William H. Tunner assumed command of the American element of the lift, which was subsequently merged with the British under Combined Air Lift Task Force. Air Commodore J. W. F. Merer became the head of British Operations and deputy to General Tunner in an outstanding example of inter-nation co-operation.

The First Air Lift Task Force operates directly under the command of

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[Photo: U.S. Air Forces

Furstenfeldbrück Air Force Base, Germany. Pilots, maintenance personnel and F-80's of the 36th Fighter Group lined up on the ramp while in the background stand the crash and fire-fighting crews

U.S.A.F.E. and, in turn, exercises control over the United States elements participating in lift operations. These include the 60th Troop Carrier Group at Wiesbaden Air Base, the 61st and 513th Troop Carrier Groups at Rhein/Main Air Base, Frankfurt, the 313th Troop Carrier Group at Fassberg in the British Zone, and the 317th Troop Carrier Group at Celle, also in the British Zone.

At the present time, two hundred C-54 Skymasters and five C-82 Packets are assigned to air-lift duty by the United States Air Force, plus twenty-four C-54's by the United States Navy. C-47 Dakotas were removed from the operation last October owing to the difference in flying speeds which interfered with air-traffic control.

One-thousand-hour maintenance inspections of these aircraft are performed in the United States, with the Burtonwood Air Depot responsible for as many as nine 200-hour inspections a day. Between 160 and 170 Skymasters are available for daily air-lift operations, with the remainder performing supplemental flights or undergoing heavy maintenance.

Co-ordination of the vast supporting network necessary to sustain the U.S. elements of the lift is a responsibility of U.S. Air Force Headquarters in Washington, with European Theatre co-ordination delegated to U.S.A.F.E.

Air-lift bases receive their supplies from Erding Air Depot and Rhein/Main Air Force Base. Before Burtonwood Air Depot became fully operational, Oberpfaffenhoffen Air Depot performed 200-hour inspections on Skymasters.

An idea of the scope of air-lift requirements may be obtained from figures on aviation gasoline requirements for a one-month period. In March U.S.A.F.E. material reports showed over 125,000 barrels of gasoline used by one air-lift base alone, or about as much as is carried in a large-size ocean tanker. This would be

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close to 5,000,000 U.S. gallons. Some 250,000 barrels were consumed by all U.S.A.F.E. bases in the same month, including jet fuel. The same air-lift base previously mentioned consumed 75,000 gallons of lubricants in a like period.

Air-to-ground communication is a vital factor in the success of the air-lift. Airways and Air Communications Service operates as an attached unit to U.S.A.F.E. The 1807th A.A.C.S. Wing at Wiesbaden exercises control over smaller communications squadrons at all air-lift and U.S.A.F.E. bases.

These units maintain and operate ground control approach systems and air-traffic control chains which enable aircraft to operate in instrument flight conditions. The position of every plane is known at all times. This greatly increases the safety factor. The air safety record for air-lift flying surpasses the over-all peacetime average of the United States Air Force.

Accurate weather forecasting also plays a major role in any air operation. Normally many hours of flying time are lost each month because of adverse weather conditions. A.A.C.S. has developed its widespread facilities to a degree whereby more than 50 per cent. of this previously lost flying time is now being utilized by air-lift transports. This highly developed weather service was a decisive factor in the air-lift's victory over the elements during the past winter.

Mentioned previously was the part that Erding Air Depot played in the period immediately following the war by the screening and disposal of Air Force material. It proved even more important to the air-lift in supplying and maintaining overworked air transports.

A visit to this tremendous depot would reveal shops for renovation of sparking plugs, rebuilding wing sections, repair of hydraulic landing gear, struts and instruments, and repair and balancing of propellers. There are electrical shops turning out renovated aircraft generators, fuel pumps and solenoids. Hundreds of unserviceable parts are repaired weekly. The instrument shops frequently operate on a twenty-four-hour basis, servicing, for example, gyro instruments, flight indicators and automatic pilot devices.

Aircraft maintenance does not stop with this requirement, however, as welders and blacksmiths must work to perform all sorts of metalwork with limited facilities. Machinists turn out precision machined parts here for aircraft and allied uses. Additionally, there are millwrights, carpenters and a great number of miscellaneous technicians.

Aircraft destined for disposal or sale to foreign governments are first processed at Erding to ensure their delivery in first-class mechanical condition. Air rearmament of friendly foreign powers is considered an important part of U.S.A.F.E.'s programme.

Turning to other phases of U.S.A.F.E.'s activities, we find that it is necessary to operate a military air-lines system to meet the need for rapid air transportation of personnel throughout Europe. European Air Transport System, or E.A.T.S., formerly had this responsibility within U.S.A.F.E., but it has since been reorganized.

E.A.T.S., as such, no longer operates. Special Missions Projects, a section of U.S.A.F.E. Operations, now provides scheduled air-line service to Berlin, Vienna and Munich, and a special duty plane from Wiesbaden to Bovingdon, England, twice weekly. Flight courier service operates between Erding, Rhein/Main, Fassberg and Celle.

Within its zone of responsibility U.S.A.F.E. supports U.S. commitments to the International Civil Aviation Organization, or I.C.A.O. Not only are American civil air carriers permitted to overfly and land at U.S.A.F.E. installations but those of certain other nations as well. At the International Civil Aviation con-

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ferences held for the European Mediterranean region in Paris during 1947 and 1948, a co-ordinated policy was established on navigational facilities, communications, weather, air bases and other aviation data.

As one result of this conference U.S.A.F.E. devised a comprehensive procedure for processing requests by foreign air-lines to fly over the U.S. Occupied Zone. Reciprocal agreements were made with some countries granting landing privileges. Requests of Norway, Sweden, Denmark, Finland, Belgium, Holland, England, France, Luxembourg, Portugal, Italy, Switzerland, Czechoslovakia, Greece and Eire have been approved. Terminals being used by these countries in Germany include Rhein/Main at Frankfurt and Tempelhof in Berlin.

Insurance against future war is, of course, the primary concern of any military organization. To aid in this cause, with a long-range view, U.S.A.F.E. encourages the development of the German Youth Programme, popularly known as G.Y.A. Properly educated youth is sound insurance against possible future aggression.

All U.S.A.F.E. bases have assigned military and civilian personnel to full-time duty in this connection. Additionally, there are a large number of volunteers. Thirty-two of these G.Y.A. youth centres are presently being operated by forty-two full-time military personnel, more than 2,000 military and dependent volunteers, and 106 German civilian employees. In March assistance was rendered to 48,757 German youths.

To maintain a steady flow of skilled personnel for the complex tasks demanded of U.S.A.F.E., an efficient training programme is necessary. Tactical training is provided by joint training operations with the British and French Air Forces, which also serve to test the combat alertness of the respective forces.

These training operations have been staged at occupation level in the European and Mediterranean areas. The practical value of this arrangement cannot be over-emphasized.

U.S.A.F.E. officers also attend a comprehensive interim training school located in Wiesbaden, with classes also held at bases located outside of this area. Courses are offered in a wide variety of subjects, including administration, operations, communications, supply, statistics, personal affairs, and ground safety. A special flight planning course for U.S.A.F.E. flying officers includes theoretical and practical meteorology, traffic-control procedure and flight-clearance practice. Other training schools offer courses in radio and supply procedures.

U.S.A.F.E.'s future tenure is, of course, indefinite. In any event, planning has been undertaken to ensure an adequate organization to meet all occupation needs until the job is completed.

In retrospect, U.S.A.F.E. was born of a world war and the need for an occupation air force. Since August, 1945, a combat strategic air force of a half a million men and 17,000 aircraft has gradually reverted to a compact, flexible occupation air force. Fighter, troop carrier and photographic reconnaissance units provide the aircraft strength immediately available for tactical purposes.

Supply and maintenance facilities formerly scattered are now located in two areas in a highly flexible form capable of meeting the other needs of U.S.A.F.E. in addition to the air-lift.

Foreign air-lines operating into occupied Germany find U.S.A.F.E. facilities at their disposal, greatly increasing their safety factor. Military personnel requiring rapid travel to widespread points can avail themselves of scheduled and non-scheduled air-lines operated by U.S.A.F.E.

Army troops in Europe have behind them a compact but expansible occupation air force.

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[*Photo: U.S. Air Forces*

Eager German youngsters crowd around one of the U.S. Air Force's mobile library units anxiously awaiting their turn to select a book of their own choosing

MILITARY APPLICATIONS OF THE HELICOPTER

(Continued from page 112)

Those are some of the ways in which helicopters can be fitted into the broad pattern of military planning at sea, on land and in the air. It is not suggested that all possible applications have been covered, nor that all these tasks will be accomplished by helicopters within the immediate future, for the present-day helicopter is by no means a perfect flying machine. Perhaps sufficient has been written, however, to convince those who control our destiny in war that there is more in this latest weird product of the aircraft designer than just a fascinating toy. The helicopter of today can perform many useful military duties; the helicopter of tomorrow may well revolutionize warfare as much as did the tank and heavy bomber.

THE COVER PICTURE

Shows the Sikorsky S51 helicopter which has already won its spurs as a Royal Canadian Air Force search and rescue aircraft, having been used on several mercy missions.

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"FLUTT'RING HIS PENNONS VAIN"

A Consideration of Military Air Transport in Peace time

By Squadron Leader A. Hughes, D.F.C.

"It therefore appears that the advisability and practicability of using the air weapon for the mass transportation of lower order combat forces bears close examination, as it very conceivably could impair the development and maintenance of the combat air arm and once again nullify its capabilities by binding it in an ancillary role to a surface component."—*Extract from the United States Strategic Bombing Survey.*

LORD TEDDER has written: "If our military thought draws its conclusions from the lush days of the last phase of the war, and directs its policy for the future on that basis, then we shall certainly not be prepared for the lean days which we should undoubtedly have to face at the outset."[1]

Even in war, when the entire national economy is geared to the demands of the armed forces, it has proved impossible to meet all requirements. Much more, then, in a democracy at peace, when the defence budget is bound to be limited, is there a compelling need to obtain value for money.

THE ROLE OF THE ARMED FORCES

The importance of this concentration on essentials has been enhanced by the tremendous increase in the destructive power of new weapons and the consequent advantages conferred on an aggressor. As long as Britain remains a democracy she must resign herself to the role of victim in any international tragedy, since her people will never countenance the construction in peace time of the juggernaut necessary for an aggressive war. Her paramount concern must therefore be the protection of the home base, whose inviolability is a *sine qua non* of effective resistance in the Commonwealth. In the words of Captain Mahan:

> "It behoves countries whose people, like all free peoples, object to paying for large military establishments to see to it that they are at least strong enough to gain the time to turn the spirit and capacity of their subjects into the new activities which war calls for."

We may be certain that whatever his strategy on land our enemy will strike immediately and without warning at the sources of our war potential by overwhelming air attack, possibly combined with airborne invasion. The armed forces must concentrate their limited strength on meeting and beating this threat, and thereby turn the conflict into a war of attrition which is the only kind of war from which Britain can hope to emerge victorious.

CONTRIBUTION OF THE ROYAL AIR FORCE

In the execution of this primary function the Royal Air Force must play the principal part by denying to the enemy the ability to move freely in British skies and waters while simultaneously laying the foundations of air supremacy over

[1] *Air Power in War*, p. 27.

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his living space by offensive action. The achievement of air supremacy is the "prerequisite to all war-winning operations, whether at sea, on land or in the air."[2] Any unit which does not contribute directly to this task in the critical first months of a major war must be ruthlessly excised unless, as in the case of the maritime and training air forces, its function is vital to our continued ability to prosecute a war. The bomber forces, or their equivalent in guided missiles, are the "principal arm of air power"[3] and may well prove the only effective counter to pilotless projectiles. Any calls for the diversion of resources from Bomber and Fighter Commands must therefore be viewed with an extremely critical eye.

AIR FORCES IN SUPPORT OF THE ARMY

The last war demonstrated conclusively the need for direct air support: without it an army is like a blindfold boxer in a straitjacket who can neither see what his opponent is doing nor reach his vitals. But there can be no question of compensating for weakness in tanks, artillery or A.A. weapons by the provision of stronger air components. The flexibility of the single-seater fighter in the last war is unlikely to be achieved again owing to the increasing unsuitability of ground-attack aircraft for alternative employment as high-altitude interceptors and vice versa. Specialized types will therefore have to be provided, and this will mean a reduction in the industrial capacity available behind Bomber and Fighter Commands. We must consequently ensure that the resources allocated to air support are related strictly to the probable size of the field army to be supported in the early months of a war.

For here is the crux of the matter: Britain's defence forces must be designed to counter an attack by a great Power. Under no circumstances can we afford to allow the requirements of peace-time police operations to influence their size or structure to the detriment of their efficiency as a war weapon. Since Britain has to maintain a strong navy and air force as a first charge on her defence budget, her field army, after the demands of A.A. and home defence have been met, is bound to be small, and certainly does not warrant a ground-attack strength well in excess of the bomber force as at present.

This argument applies with particular cogency to airborne forces. Despite their spectacular successes, it is by no means universally accepted that such forces represent an economic means of achieving an objective. The mere existence of an airborne army is said to constitute a threat to the enemy compelling him to look to the defence of back areas. But this holds good only when one's own forces are on, or in a position to assume, the offensive. So fantastically expensive a weapon cannot be squandered by committing it to battle without the certainty of a speedy link-up with the main armies. To employ airborne troops in defence is itself an admission of defeat, an indication that the situation is sufficiently desperate to warrant such waste. Unless the present balance of military strength is radically altered, however, the forces of Western Union can hope to do no more, even with available American assistance, than offer a stubborn resistance to the enemy. Ideas and plans for going over to the offensive within two years of the outbreak of hostilities are pipe-dreams as unpractical as 1940 plans for the reinvasion of the Continent.

Again, the employment of airborne forces, and the successful use of air transport and air supply in the battle area or between theatres demand as a prerequisite a large measure of ascendancy in the air battle. By the very diversion of produc-

[2] *Air Power in War*, p. 32.

[3] Ibid., p. 23.

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tion capacity to the provision of transport aircraft, however, we are depriving the bomber forces of potential strength and thereby are delaying the achievement of air supremacy. It seems therefore beyond doubt that until we have won the initial air battle and have had time—probably at least two years—to integrate our economy into the needs of war, large-scale use of transport aircraft can be disregarded as impracticable.

MILITARY AIR TRANSPORT IN PEACE

Protagonists of military air transport may cite Operation "Plainfare" as an example of its value. But no air force can be designed or maintained to supply in peace time the basic needs of a modern city. Moreover, such experience as "Plainfare" has furnished is of value mainly to civil operators and tends to give an exaggerated impression of the possibilities of air supply as a military factor. The Royal Air Force has gained little to offset the progressive debilitation of Bomber and Coastal Commands by the dissipation of man-power and material resources in this non-military operation.

Disregarding the air-lift as an unfortunately necessary and, it is to be hoped, temporary expedient, what is it expected to achieve with military air transport? Airborne operations in peace time are clearly prohibited by the immense cost which is quite disproportionate to any results that might be produced. The aspect of transport aircraft most commonly emphasized is their supposed ability, at the mere murmur of the incantation "air-transported," to waft armies effortlessly across the globe. Brigadier Smyth,[1] for instance, in his proposed Imperial defence system based on regional garrisons and airportable striking forces, assumes that four divisions could be flown from Ceylon to reinforce Singapore within forty-eight hours (Z + 2 and Z + 3 days), glossing casually over the effort required which could be accomplished only by some 5,000 Hastings already based in Ceylon—clearly a logistical flight of fancy.

As a means of transportation aircraft suffer from two major disabilities: range and cargo capacity, which together tend to nullify the advantages which may be gained by the speed of flight of an individual aircraft. Capacity is restricted both as to size and weight. This means, firstly, that considerable numbers of aircraft (and hence personnel and bases) are required to lift a large force in a short time; and, secondly, that bulky or heavy loads, such as tanks, heavy A.A. guns, medium artillery, vehicles larger than three-tonners, engineer stores and equipment, petrol and water tankers, specialist workshop vehicles, cranes and tractors, will for many years remain impossible. Army or Air Force units moved by air are therefore of limited fighting value and it is doubtful whether a slightly more rapid arrival will offset their relative immobility once they are on the ground. Range limitation means, firstly, that certain parts of the world are still beyond the economical reach of aircraft (the troubles in Honduras and the Falkland Island Dependencies illustrate this), and, secondly, that before air transport can function at all a network of staging posts and navigational facilities must be provided not more than 1,000 to 1,500 miles apart. This network is costly to maintain and does not at present possess the capacity to handle emergency moves of major formations east or south of the Canal Zone.

Apart from these drawbacks, moreover, it has yet to be seen whether air transport does in fact confer any worth-while benefits. Clearly it would immensely ease our problems and compensate for the exiguousness of our forces if we could hold the bulk of them in the United Kingdom, thus reducing our overseas expen-

[1] *Defence is Our Business*, by Brigadier J. G. Smyth, V.C., M.C., p. 73.

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diture and assuring the defence of the home base, and yet retain the ability to be strong in any area where strength was required. The limited resources of the R.A.F. are unlikely, even if the bomber and maritime forces continue at their present dangerous level, to permit the provision in peace time of more than some fifty long-range (Hastings) and a hundred medium-range (Valetta) aircraft. Let us see what such a force could achieve should there be a sudden need to transfer one division from the United Kingdom to, say, Iraq. The route would be Malta—Canal Zone—Habbaniya, stages of 1,150, 1,000 and 750 nautical miles respectively. Allowing for time lost in take-off and landing, a minimum of fifteen hours' flying time would be involved, or thirty hours for the round trip. Including time for loading and unloading, and for refuelling *en route*, each flight from the United Kingdom to Iraq and back could not be completed in much less than forty-eight hours. Allowing again for base and route inspections and for the serviceability factor, an effort of two round trips per week per established aircraft would seem to be the maximum likely. On this basis, the total lift would be 300 sorties per week (100 Hastings and 200 Valettas) at an average payload over that distance of some 8,000 lb.

On the basis of a ratio of 8,000 : 5,500, therefore, we may assume that the same division will require some 1,800 Hastings/Valetta sorties, or six weeks' continuous effort from the whole transport force. A small comparative table, again only approximate, will serve to bring this into perspective:

	By Air.	*By Sea.*
Planning, assembly and loading ..	3 weeks	3 weeks
United Kingdom to Habbaniya ..	6 weeks	—
United Kingdom to Basrah ..	—	3 weeks
Basrah to Baghdad	—	3 weeks
Total	9 weeks	9 weeks

Provided, therefore, that sufficient shipping could be obtained—and surely if the emergency were so serious this could be requisitioned or supplied by the Navy—a fully equipped, fully mobile and self-supporting division can be moved by sea as quickly as a semi-mobile division can arrive by air. It is true that by air the build-up would be gradual and that a brigade could be available within two weeks, but this raises further problems. The mere transfer of a division does not *ipso facto* increase the fighting strength of the receiving formation. That division must be supplied and kept supplied. In a moderately active role a division on a light scale requires from 150 to 200 tons per day. Fully active, a normal infantry division consumes from 350 to 400 tons per day; an armoured division still more. And whereas a normal division will, when operating independently, have its own first-line and second-line transport to haul its supplies from railhead, an air-transported division is largely dependent on the local resources. To enable it to fight, either the vehicles, base organization, spares and so on must be available in the area to which it is sent, or it must be supplied by air from some main base. Since it is unlikely that we shall be able to afford in peace time to maintain skeleton base organizations in every overseas theatre, it is probable that our division would have to be fed by air from the Middle East. From the arrival of the very first units, therefore, a progressive number of aircraft would have to be transferred from the primary task of transport to the secondary one of supply, with a consequent increase in the time required to complete the move.

The suppositious mobility afforded by air movement is thus seen to be largely

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a mirage as far as major formations are concerned. And this applies equally to air force units, for although it is perfectly feasible to move and operate individual squadrons (as has been shown by the "Sunray" detachments) extensive reinforcement by air of overseas theatres cannot be undertaken successfully because of the dependence of air force operations for their effectiveness on a complex ground organization which cannot be created overnight and which is too expensive to maintain on a permanent basis. It is therefore suggested that the very dubious advantages conferred by air movement do not justify the immense cost of maintaining in peace time a military air transport force on the scale at present envisaged.

THE SOLUTION TO THE PROBLEM

Nevertheless, the importance of air transport as a factor in the efficiency of our armies is such that it is essential to retain a nucleus of military transport aircraft which, without jeopardizing the effectiveness of the bomber and maritime air forces, will be capable of expansion after the outbreak of war *pari passu* with the growth of those armies. Such a nucleus is particularly needed in view of the growing divergence in the characteristics desirable in transport support, as opposed to pure transport aircraft, a tendency likely to be aggravated by the installation of turbo-props. or jet engines in civil air liners.

It is therefore proposed that a Central Transport Establishment on the lines of the C.Ph.E. should be set up. This unit might consist of two squadrons, one experimental and the other operational. The former would be charged with research in consultation with Army experts into the characteristics of the ideal transport aircraft, with trials of any potentially suitable new types and with the prototype military conversion of any civil type adopted as standard equipment by the State air lines. The operational squadron would be responsible for training selected Army and R.A.F. personnel in parachute and glider technique, for providing airborne participation in Army manœuvres, for the preparation and execution of small-scale S.O.E. or S.A.S. missions in the early stages of a war, and for the provision of V.I.P. facilities on a very limited scale. From this concentration into one unit of all transport functions in the United Kingdom should ensue a substantial saving in overheads, and the preservation and development of existing techniques and knowledge would be assured.

In addition to this central repository of information the maintenance in each overseas command of a small transport force can be justified on the grounds of the large areas to be covered and the paucity of surface communications. In Malaya particularly, where operations against subversive elements may well become a permanent feature, valuable experience in air transport and air supply should be gained. But the size of such forces must be kept to the minimum consonant with the efficient and economic discharge of the functions of the command. Convenience is no criterion: it must be shown that the provision of aircraft does in fact achieve economies sufficient to outweigh their cost. It would, moreover, be advantageous to equip these units with transport support or freighter types of aircraft in order to obtain practical experience of their operation and to provide a pool on which to draw for small airborne assaults in the early part of a war.

But the most substantial benefits to the country's defences as a whole are likely to accrue from a much closer integration of the State air lines and the Royal Air Force. Britain's dependence on the maintenance in a flourishing condition of her merchant navy and shipbuilding industry has long been tacitly recognized. It is now necessary to inculcate in the mass of the people the same attitude towards

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their merchant air force and the industry which sustains it. For many years to come civil air lines will probably have to be subsidized to the tune of several millions a year. This must be seen by the taxpayer as part of the price we are paying for defence in a troubled world. But, of course, such a view is tenable only if it is clear that the civil air lines are in fact making a worth-while contribution to our defensive strength.

It is therefore suggested that certain steps should be taken to ensure this, and there seems to be no good reason, other than the natural aversion of the civilian and the civil servant to military interference, why some should not be initiated at once. Tabulated briefly for the sake of clarity, these steps are:

(*a*) All pilots, navigators, signallers and flight engineers, together with key maintenance personnel of the State corporations, should be required by their contracts to serve periodic and substantial terms with Royal Air Force units, and to pass certain flying and technical courses. Naturally, this service must be generously paid if it is to be accepted without resentment. The R.N.R. is an example of the successful implementation of such a scheme.

(*b*) R.A.F. aircrew should be seconded for terms of service as supernumerary personnel with the corporations.

(*c*) Members of the headquarters staff of the corporations, particularly senior officials, should attend courses at the Central Transport Establishment, the R.A.F. Staff College or the I.D.C., so that they may be kept aware of the military aspects of air transport and air supply.

(*d*) During peace time the carriage of priority Service personnel, mail and freight should be undertaken by the State air lines without interdepartmental adjustment.

(*e*) Plans should be made for the emergency provision at short notice by the State air lines of up to a battalion lift—some thirty Skymaster or fifteen Stratocruiser sorties.

Apart from this integration of the civil and military air forces, consideration should be given to the encouragement of private charter firms operating freighter aircraft likely to be suitable for transport support work. Moves of small units, such as the "Sunray" exercises, could very well be undertaken by firms like Air Freight or Skyways. By these expedients the essential peace-time needs of the armed forces for air transport could be met and the growth and efficiency of our merchant air fleet fostered so as to provide a reserve of trained aircrew and ground engineers for war-time expansion.

With personnel thus to some extent familiar with R.A.F. equipment, and with the rapid conversion of aircraft to military purposes made possible by the work of the experimental squadron, the civil air lines could easily be assimilated into the combatant air forces on the outbreak of war. They could operate either under the joint control of the Ministry of Transport and the Air Ministry (on lines similar to the war-time control of the Merchant Navy) or as an integral part of the R.A.F.—a resuscitated Transport Command, ready again to play its part in the victory of our arms without having been, in peace time, a hindrance to the development of their fighting power.

[NOTE.—*It is realized that this article is somewhat contentious. Attention is drawn to the notice at the foot of the Contents page. Views expressed in this journal are those of the authors, and are not to be construed as the official opinions or policies of the Air Ministry.*—ED.]

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ROYAL NAVAL AIR ARM

NEW VICE-CHIEF OF NAVAL STAFF

[Photo: Royal Navy Crown Copyright Reserved

Vice-Admiral Sir G. E. Creasy, K.C.B., C.B.E., D.S.O., M.V.O.

THE inset portrait is of Vice-Admiral Sir George E. Creasy, K.C.B., C.B.E., D.S.O., M.V.O., whose appointment to be a Lord Commissioner of the Admiralty and Vice-Chief of Naval Staff in succession to Admiral Sir John H. Edlesten, K.C.B., C.B.E., to date November, 1949, was recently announced.

In 1948 he succeeded Admiral Vian as Fifth Sea Lord. At 53 he is one of the younger school of admirals.

After the war Admiral Creasy became Rear-Admiral, Aircraft Carriers and Air Stations, British Pacific Fleet and East Indies, and while holding this command he visited Australia and New Zealand, flying his flag in the aircraft carrier H.M.S. *Theseus* last year.

NEW FIFTH SEA LORD

The appointment of Rear-Admiral M. J. Mansergh, C.B., C.B.E., to be a Lord Commissioner of the Admiralty, Fifth Sea Lord, and Deputy Chief of Naval Staff (Air), to date October, 1949, has also been announced.

Admiral Mansergh flew his flag in H.M.S. *Theseus* as Flag Officer of the Squadron during the recent Western Union Naval Exercise. He is now responsible for the general direction and co-ordination of policy in all naval air matters. In his capacity as Deputy Chief of Naval Staff (Air) he deputizes for the Chief and Vice-Chief of Naval Staff as necessary.

THE ROYAL NAVAL FLYING CLUB

Four admirals have so far joined the Royal Naval Flying Club, which after being suspended during the war, has reopened with headquarters at Gosport. One of them, Rear-Admiral The Mackintosh of Mackintosh, was the first member to fly one of the Club's aircraft solo. He is 52 and took the first naval observer's course in 1921 and learned to fly four years later. He is Vice-Controller (Air). Lord Mountbatten, who flew solo in 1944, is continuing his pre-war membership. Another member is Vice-Admiral R. H. Portal, Flag Officer (Air), Home. He is a brother of Lord Portal, the former Chief of the Air Staff, Royal Air Force. The Club's President is Vice-Admiral Sir George Creasy. Most of the Club's members are ex-R.N.V.R. officers who flew with the Fleet during the war and are anxious to keep their hand in.

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A WORD FOR SEA POWER

Readers will have been interested in the article in the July number, "The Influence of Air Forces on Sea Power," which gives the author's views on the handicaps now facing naval forces in this modern age of air power. Undoubtedly in the past sea power has played a decisive role in shaping the modern world. All major wars in history have ended in victory for those holding command of the seas.

With recent knowledge of guided missiles, atomic bombs and other modern methods of air attack, it would be wrong to suppose that they have completely obliterated sea power and the traditional pattern of warfare.

In any war between Russia and members of the Atlantic Pact, command of the seas would still be essential to victory, but this could not be achieved by the maximum combined naval strength of the latter unless command of the air was also maintained.

If it was necessary to state which should take priority at the outset of war with Russia, clearly our first vital need is command of the air. It must be realized, however, that this could not be maintained for any length of time unless we had command of the seas also. Never in history have two fighting Services been so dependent upon each other.

The navies and the air forces opposed to the U.S.S.R. have a role beyond that of keeping open our sea routes, to prevent Britain starving and to allow the transportation of reinforcements and war supplies. Their function would also be to contain the enemy and prevent them using the seas to overrun key areas of the Old World by transporting their vast armies to other shores. That invasion by other means would be tried is without doubt, but command of the air and seas would give the time essential to develop and bring the might of American forces to the aid of her Western allies. (The more difficult task of delaying their advance overland would fall to our combined air forces and the armies of the Western Powers available in Europe.)

The development of the Russian submarine arm confronts the Allied naval commands with new problems of defence, as does the possible menace of guided missiles or even atomic bombs. Experts have been studying the problem and may well have found successful counter-measures.

The need for a strong naval arm should not be under-estimated: it is vital to our needs in any future war. For victory we must first gain and hold command of the air and this cannot be achieved without the Navy, any more than command of the seas, another essential, can be achieved without command of the air.

EDITOR'S NOTE

The absence of the representative professional views of members of the Naval Air Arm from the columns of this journal in the past on such vital subjects as sea power and air power has always been a matter for regret.

Royal Air Force officers' views on such matters have been published repeatedly and, of necessity, this must be held as a one-sided approach to a subject of great importance to all His Majesty's Forces and tending towards "one-track-mindedness." The Chief of Naval Information at the Admiralty has kindly offered his assistance in providing articles from the Naval Air Arm for this journal. We hope that this will stimulate healthy discussion on naval-air co-operation, which will be of inestimable value to all concerned. We should welcome any contributions to these columns, either in the form of "Letters to the Editor," descriptive articles on "Life Today in the Royal Naval Air Arm," or more serious articles on professional subjects connected with our Air Arm. Suitable remuneration will be sent for all contributions published, which should be sent through the usual channels for censorship, to the Editor, Group Captain A. H. Stradling, O.B.E., R.A.F. (ret.), The Old Cottage, Maplehurst, near Horsham, Sussex.

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AIR FORCES FORUM OF DISCUSSION

(Write to the R.A.F. Quarterly about it)

LETTERS TO THE EDITOR

SIR,

The articles in your April issue entitled "Education in the Royal Air Force" and "Selection for Leadership in the Royal Air Force" are interesting and welcome. Without wishing to make any direct criticism of them, I am, nevertheless, prompted to point to what I believe is one of the gravest dangers which beset our great Service today: *the emphasis on technical efficiency at the expense of human qualities.* Doubtless the authors of both articles would agree substantially with me.

Technical proficiency is an item which may be more readily grafted upon an educated than an uneducated man. But the process of grafting such technical proficiency is not "education." It is rather a matter of "technical instruction."

Therefore I would contend that the opening lines of the second column on page 100 are inconsistent with a conception of education in its broader and traditionally British sense, and indeed the education which promotes those precise human qualities required to cement the cohesion of our Service. On the other hand, if education in the Royal Air Force means elementary schooling in mathematics, a course in citizenship and other essential subjects, then it is a far cry from any conception of education in our best schools.

This emphasis on the technical nature of life in the Royal Air Force is probably also at the bottom of a slightly iconoclastic spirit expressed in the penultimate paragraph of the excellent article "Selection for Leadership." Having had the privilege of inspecting some of our schools as an accompanying staff officer or to lecture or merely as a casual visitor, I feel convinced that it is their wider conception and background of education which is too often failing in our own Service.

Thus, putting two and two together, I would say that we do wrong to think too narrowly of education in the Royal Air Force. We must not allow ourselves to conceive technical instruction as the first aim. What we want first is good men. With good men we can have as much technical instruction as we like.

The broader education is available at its best in the schools which have in many cases built up an inimitable tradition through several centuries. Failures may issue from them, of course, but boys who go to these schools are given opportunities which are unparalleled in the civilized world. Any tendency to decry the "public school type" is in my opinion music in mourning.

Let me summarize by stating briefly my views that:

(*a*) There is a grave danger in emphasizing technical efficiency at the expense of human qualities.

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(*b*) "Education" in the Royal Air Force is more in the nature of specialized instruction, which is most excellent and necessary, but this use of the word should not blind us to the broader conception of education which must be fostered.

(*c*) The best antidote to a certain lack of cohesion in our Service today is to absorb into it as much officer material as possible from those schools whose traditions fit them peculiarly to act as a stabilizing influence in these rather uncertain times.

(*d*) There are few things which are more likely to discourage the best boys in our best schools from joining the Royal Air Force than this over-emphasis upon the technical characteristics of life in the Royal Air Force.

Yours faithfully,

J. R. GORDON-FINLAYSON, *Wing Commander.*

* * * *

SIR,

The publishers and yourself are to be warmly congratulated on the excellence of the new QUARTERLY, both as regards format and size. It represents a considerable improvement on previous issues and must certainly stand alone in its sphere.

It was pleasing to discover the survey of R.A.F. sport in the current issue. One is aware of space limitations, but it is only fitting that the premier R.A.F. publication should devote some space to a phase of Service life the importance of which in peace time particularly cannot be over-stressed. At a time when it is essential to restore that spirit and pride in the unit so characteristic of the pre-war R.A.F., one of the most useful mediums has proved to be sport and games.

Most station commanders now realize the intense preoccupation of the average Englishman with sport, and if this can be found an outlet in well-organized competitive games the morale and spirit of station life will be greatly improved. It will help a man to take an interest in his unit and not, as has often been evident since the war, regard life in the Service as a job to be tolerated between week-ends.

Yours faithfully,

P. A. WARD-THOMAS.

* * * *

SIR,

Many officers in the Royal Air Force hold staff qualifications such as "*i.d.c.*," "*p.s.a.*," "*p.s.c.*" or "*j.s.s.c.*" This indicates that they have completed courses at the Imperial Defence College, R.A.F. Staff College, Naval or Military Staff Colleges or Joint Services Staff College.

I assume that the best brains of our air arm are selected from a field covering most branches, who, after intensive study and training, return to fill staff appointments.

Would it not add to their prestige at conferences with other arms and to the dignity of staff headquarters generally if such officers wore some distinctive emblem to indicate their qualifications?

Perhaps a plain Air Force blue "aiguillette," worn over the right shoulder, would be a suitable distinction; possibly with the addition of a gold thread running through it, for "*i.d.c.*" officers.

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Officers of the British Army and those of Continental armies wear such staff distinctions. Why not our Royal Air Force officers?

I should appreciate other views on this matter.

Yours faithfully,

C. V. KERPEN.

* * * *

SIR,

With reference to B. T. Hurren's letter on the "black-out" question in Vol. 1, No. 1 (new series) of the QUARTERLY. I would point out that by "blacking-out" the country during the last "tribal struggle" we made the enemy bomb aimers' task of map reading on to a definite pin-point target a more difficult commitment than it might otherwise have been. This increased difficulty forced the enemy to occupy the minds of certain scientists on the devising of ways and means of reaching and bombing an unseen target, this preoccupation curtailing their production of new "frightfulness" for a time. When the ways and means had been devised the manufacture of the equipment required employed a useful war potential of man power and material which might otherwise have been employed in the manufacture of even greater "frightfulness."

With reference to the reflected light from searchlights, I feel that B. T. Hurren exaggerates the negative effect of the reflected light on the effectiveness of the "black-out." No doubt from the ground buildings appear to be well illuminated by this weak light, but the strength of such light is negligible by the time it has passed through the light-dispersing qualities of a large portion of atmosphere on its way to an enemy aircraft flying at 20,000 feet some miles away. Here it impinges on the visual purple in the eyes of the bomb aimer, giving a translation to the brain the efficiency of which is dependent on the supply of *ersatz* vitamin A in the victim's meals! Further, a flash from a searchlight in those eyes and any hope of using the reflected light reaching the aircraft is gone for half an hour, the approximate time required to regain dark adaptation, and no doubt by this time the target area would be getting somewhat "hot"!

In closing, let me remark that perhaps in the next "tribal struggle" we will transfer our custom in respect of "black-out" material to the manufacturers of polarized light filters adapted for fitting to window openings!

Yours faithfully,

D. G. HUMPHRIES, *Flight Sergeant.*

SIR,

* * * *

I suspect that your correspondent wrote his fulmination against the black-out with his tongue in his cheek to provoke a lively controversy, and that he well knows that the black-out, both here and in Germany, was the most important item of air defence at night. The arguments are unsound because:

(*a*) The blacked-out town was *not* illuminated by reflection from searchlights unless a great many searchlights were reflected from low cloud. Even then the amount of illumination was not great and the crew of an aircraft flying below the cloud would probably be entirely dazzled by the lights, which would fix on the aircraft. The crew would know how the rabbit feels in the headlights of a car. Almost always, searchlights dazzled, and far from providing a sight of the ground were the most efficient means of obscuring it.

(*b*) The efficiency of navigational aids and means to bomb a site unseen are greatly over-stated, as always. The best blind bombing we had during the war was not nearly as accurate as visual bombing, and we were much in advance of the Germans. After the "Knickebein" system they had nothing effective.

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(*c*) The best target for bombing is a bright light on a dark night—better than any target in daylight in an industrial area where smoke and haze obscure the ground, as the U.S.A.F. found after leaving Texas. Lights shine through industrial haze and thin layers of strato-cumulus. England with the lights on would have presented perfect bombing targets without trouble or complication. It is easy to find your way round a country with all the lights lit—much easier than trying to identify towns on a P.P.I. tube. Special maps showing the light patterns would have enabled the Luftwaffe to find any target without difficulty and attack really important objectives which were too small to hit other than by visual bombing.

Another argument which was once advanced in favour of turning the lights on was that fighters would have been able to see the attacking bombers against the reflected glare. This is another fallacy: the sky is too big to illuminate from the ground. It takes the sun to do that. Most of these cranky ideas arise because people think that they can do better than the sun in providing light, and that a mass of radio contrivances can see better than the human eye. (I know the electron microscope can do better than the eye, but it is not applicable to bombing.) In 1944, after four years of bombing Leonard Cheshire showed that a competent pilot without any mechanical assistance but the right sort of aircraft could do what all the resources of the radar empire had been unable to do—put a marker accurately on a small target so that it could be bombed. If all the lights had been on, there would have been little need of target markers.

Yours faithfully,

J. B. TAIT, *Wing Commander.*

* * * *

SIR,

Group Captain Collard, in his article "A Bomber Station Today" (July issue), places much-needed emphasis on the fact that each man at a flying station should constantly be reminded of how his particular job, however seemingly obscure, is related to the aim of keeping the aircraft flying.

There is a danger, he says, under the three-wing organization, lest each part become too watertight and forget that the sole aim of the organization is to put aircraft into the air.

To my mind the term "three-wing" is unfortunate, as it does not help in forming a clear picture of how this organization works towards attainment of the aim. Without changing the three-prong principle, it would seem more logical to call it "two-wing" and the organization likened to a bird in the following manner:

The whole station must revolve round the aircraft; they are the *raison d'être* of the station. Let them, then, be represented by the body of our analagous bird —the body which has to be kept in the air by two "supporting" wings—the technical on one side and the administrative on the other.

This attitude immediately puts all sections in perspective, stressing the prime importance and spearhead aspect of the aircraft and aircrews, and indicating that the two supporting wings are not ends in themselves. It would then be simple for, say, an electrician in the technical wing and an equipment assistant in the administrative wing to see how their jobs "tend towards the achievement of the aim to get the aircraft in the air."

(This is, incidentally, more in keeping with the origin of the term "wing" as applied to formations, which in cavalry usage meant a "support element.")

Yours faithfully,

R. E. G. PIFF, *Flight Lieutenant.*

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A gathering of some members of Headquarters, Bomber Command, Riding Club, on West Wycombe Village Green. **(See page 149.)**

Royal Navy and Royal Air Force Cricket Teams. Match played at Halton on 3rd and 4th August, 1931

Standing: *Collins, umpire, Aldershot Command; Flying Officer G. P. Longfield, R.A.F.; Lieutenant T. C. G. Jameson, R.N.; Sub-Lieutenant P. C. Meyrick, R.N.; Pilot Officer C. W. M. Ling, R.A.F.; Lieutenant Commander R. J. Shaw, R.N.; Corporal W. Day, R.M.; Squadron Leader L. H. Slatter, R.A.F.; Squadron Leader C. B. Cooke, R.A.F.; Newman, umpire, Hants*

Seated: *Lieutenant Commander E. L. D. Bartley, R.N.; Squadron Leader R. E. G. Fulljames, R.A.F.; Commander R. L. B. Cunliffe, R.N.; Squadron Leader B. E. Baker, captain, R.A.F.; Major R. A. D. Brooks, captain, R.M.; Flight Lieutenant A. J. Holmes, R.A.F.; Major C. H. Congdon, R.M.; Squadron Leader G. E. Livock, R.A.F.*

Seated on ground: *Sub-Lieutenant R. P. Hammond-Chambers-Borgnis, R.N.; Pilot Officer D. R. Bader, R.A.F.; Flying Officer B. C. Yarde, R.A.F.; Paymaster Lieutenant Commander C. E. Glenister, R.N.; Flying Officer E. C. Huddlestone, R.A.F.; Lieutenant K. A. Sellar, R.N.*

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SPORT IN THE R.A.F.

By J. Sephton

ATHLETICS

At the Royal Air Force Inter-Command and Individual Athletic Championships, Air Marshal Sir Cyril B. Cooke, K.C.B., C.B.E., Air Officer Commanding-in-Chief, Maintenance Command, took the salute at the march past of the competitors on the final day.

The meeting was a great success, and, although the all-round standard was slightly behind that of previous years, five new individual records were set up, three in the men's events and two in the W.R.A.F. events.

Squadron Leader L. Reavell-Carter, with a throw of 137 ft. 9 in., created a new discus record; Aircraftman Swaisland threw the javelin 192 ft. 1 in.; and Sergeant Cobley, of R.A.F. Station, Cosford, set up a new time for the two-mile steeplechase in 11 min. 1.6 sec.

In the W.R.A.F. events, Corporal Wilkinson, of R.A.F. Station, Wilmslow, broke the 100 yards and 220 yards records in 11.9 sec. and 27.6 sec. respectively.

Technical Training Command won both the R.A.F. and W.R.A.F. Inter-Command Trophies with 86 points and 51 points respectively.

In the Inter-Services Athletic Championships held at Aldershot on 27th July, the Royal Air Force were second to the Army, and the W.R.A.F. were runners-up to the W.R.A.C.

LAWN TENNIS

With Lady Robb, on the left of this picture, is Wing Officer M. F. Arkell, winner of the W.R.A.F. singles. On the right is Sergeant L. G. MacKenzie, the runner-up. This pair were also winners of the doubles championship

At the Royal Air Force Lawn Tennis Championships at the All-England Lawn Tennis Club, Wimbledon, the weather was ideal for tennis and some excellent matches were enjoyed by the spectators throughout the week.

Aircraftman A. G. Roberts, R.A.F. Station, Pershore, won the singles championship for the second time in succession, defeating Corporal H. Bernstein in the final. In the doubles championship Corporal Bernstein and Flying Officer Good were successful against Squadron Leader Frith and Aircraftman Roberts.

In the W.R.A.F. singles Wing Officer M. F. Arkell, Headquarters, Coastal Command, was also successful for the second time, after a hard match in the final with Sergeant L. G. Mackenzie, of Headquarters, No. 21 Group. Wing Officer Arkell and Sergeant MacKenzie defeated Flight

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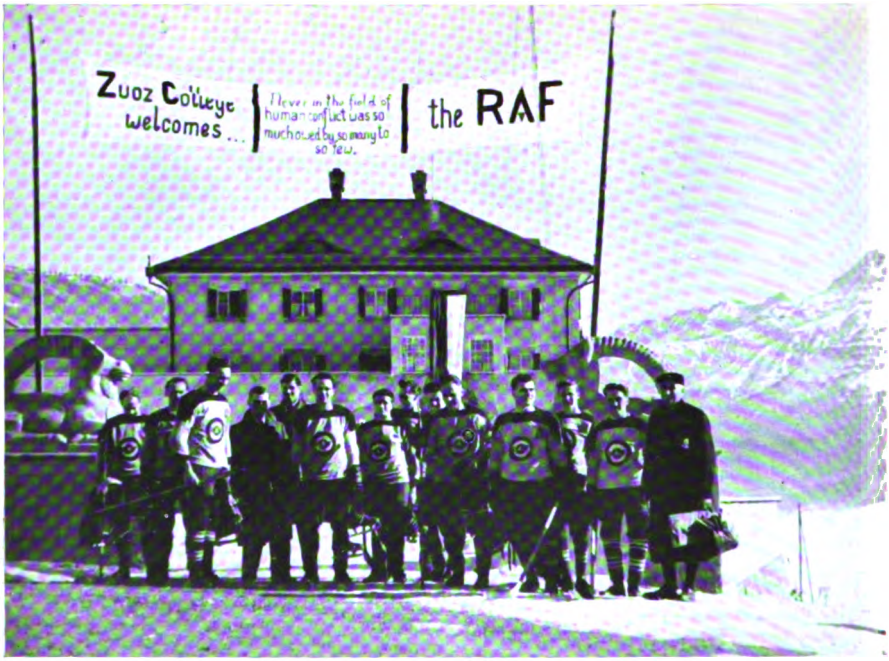

R.A.F. ice hockey team at Zuoz College

Far East Command Championship supper party

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Officer J. P. Yeomans and Squadron Officer A. Causton in the final of the doubles championship.

In the Inter-Services Championship, also held at Wimbledon, the Royal Air Force won the championship for the second year in succession by 9 rubbers to the Army's 5 and the Royal Navy's 4. The W.R.A.F. wrested the Inter-Services Women's crown from the W.R.A.C. by 8 rubbers to the W.R.A.C.'s 5 and the W.R.N.S.'s 2.

We all know what hard work and endless practice must have been undertaken by all these competitors before these victories were won. It is indeed "Per ardua ad astra."

SWIMMING

The accomplishments of the Royal Air Force in the air are well known, but their prowess in the water in 1949 is also something to be proud of.

Under the guidance of the Chairman of the R.A.F. Swimming Association, Wing Commander C. D. Tomalin, D.F.C., A.F.C., who was himself a member of the British team in the 1936 Olympic Games and A.S.A. diving champion, the Air Force team has won one success after another.

Early in the season matches were arranged with the leading clubs in the London area. These included Plaistow, Otters, Penguins, Kingsbury, Kent County, Metropolitan Police, and Sutton and Cheam, all of which had members of the 1948 Olympic team swimming for them.

Included in the R.A.F. team were Pilot Officer R. G. Franks and Aircraftmen J. Service and P. Elliott, also competitors in the 1948 British Olympic team, who were ably supported by Aircraftmen W. B. Tillotson and B. W. Manley, the former 220 and 440 yards Inter-Service champion and the latter the 100 yards Inter-Service back-stroke champion.

Seven of these eight fixtures were won by the R.A.F. and that against Kent County was drawn.

Well done, the Royal Air Force! With this strong nucleus for a team, and the hoped-for discovery at the R.A.F. Championships of "dark horses," it is hoped that we shall repeat our 1948 success and win once again the Inter-Services Championship.

ICE HOCKEY

With the rapid approach of winter, let us look over our shoulder at the results of our début at this sport in 1948.

Under the auspices of the R.A.F. Winter Sports Association, Flight Lieutenant D. G. Evans, as team manager and captain, was given the task of raising a representative side for the R.A.F. With the best possible equipment from Canada, a team was fitted out and went into serious practice.

For their first appearance in public, at Richmond, they seemed to have taken on rather a formidable task, against an unbeaten team from Oxford University, but the high standard of play of this new R.A.F. team was demonstrated by a victory of 4 goals to 2.

In their first home match, before an audience of some 10,000 spectators, they defeated the Wembley Colts by 4 goals to 3. The excellent hockey played by the R.A.F. team brought an invitation from the British Ice Hockey Association to play against an all-Canadian team in Paris. On this occasion they met their match and were defeated by 11 goals to 4. On their return to the United Kingdom they had their revenge by beating the Canadian naval side by 5 goals to 3. Last winter, playing in international matches at Lausanne, Davos, Arosa and St. Moritz, they won four of those and were only narrowly beaten in the other six. On their return to England they fought their way through to the final of the British I.H.A. Cup

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Competition, and were beaten only after a hard-fought-out game by 3 goals to 2; and this by a crack Wembley team.

Of 21 games played during the season the team have won 14, lost 6 and drawn 1; goals for, 90; goals against, 65. This brings great credit to the team, and here is another game that has brought the outstanding team work of the R.A.F. in work and sport to the attention of the general public.

We wish the R.A.F. ice-hockey team every success in 1949-50.

FAR EAST COMMAND CHAMPIONSHIP

The contests for the Command Championship Trophy, for the best all-round unit in sport, was carefully organized for 1949. All ranks showed the greatest enthusiasm and every match was keenly contested. Eleven units, of more or less equal strength, were selected from within the Command, each to nominate a team of thirty competitors to represent them. From these teams were drawn the contestants at eliminating matches in their own areas in cricket, tennis, shooting, rugby, soccer and hockey. The method of scoring for the competition was:

Losing semi-finalist, 1½ points; losing finalist, 3 points; drawn finalists, 3½ points; winners of finals, 4 points.

The four successful teams in the eliminating rounds proceeded to Singapore to compete for the Lloyd Trophy.

After some exciting matches in this variety of sport, the championship team was the TECHNICAL WING, SELETAR, with 19 points; 2nd, Hong Kong, 17½ points; 3rd, Kuala Lumpur, 13½ points; 4th, Negombo, 10½ points.

The results of the matches which preceded this victory were:

Cricket.—Winners, Hong Kong; runners-up, Negombo.

Tennis.—Winners, Hong Kong; runners-up, Seletar.

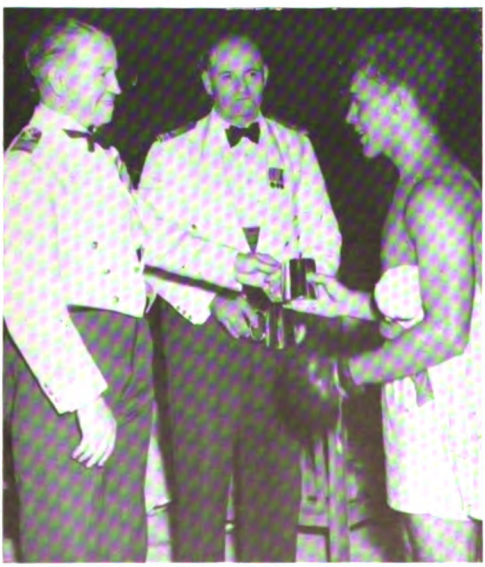
Shooting.—Winners, Seletar; runners-up, Hong Kong.

Hockey.—Winners, Seletar; runners-up, Kuala Lumpur.

Rugby.—Winners, Kuala Lumpur; runners-up, Seletar.

Soccer.—Drawn, Seletar and Hong Kong.

Added interests to this "Command Week" were other contests (not scoring points for the Lloyd Trophy) in sailing, boxing and netball, and arts and crafts. Changi Yacht Club, represented by Wing Commander R. C. Ayling and Corporal L. Dixon, won the sailing, and Changi "A" Team the W.R.A.F. netball. Leading Aircraftman Marshall won the light heavyweight boxing contest.



Air Marshal Sir Hugh Lloyd presenting his trophy to Leading Aircraftman Marshall

The championship concluded before a large gathering, including H.E. The Governor of Singapore and many senior officers. The Commander-in-Chief (Air Marshal Sir Hugh P. Lloyd, K.B.E., C.B., M.C., D.F.C.) presented the Lloyd Trophy to Group Captain R. B. Harrison, the captain of the winning team, after which "fun and games" were enjoyed by all at

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a party provided at the Chalet Club. From the picture on page 146 Sergeant Wedge, W.R.A.F., appears happy and contented with the victory of her netball team, after many hard-fought matches.

Sergeant J. Wilkinson, W.R.A.F. Captain of the W.R.A.F. cricket eleven. Has also captained the women's Lancashire eleven, played in women's test matches in Australia and New Zealand, and was top scorer for England in their match against "The Rest," at Old Trafford. She is a forceful bat and useful spin bowler

HEADQUARTERS, BOMBER COMMAND, RIDING CLUB

The Headquarters, Bomber Command, Riding Club was founded in April, 1948, as a result of a meeting of a few riding enthusiasts at Headquarters, Bomber Command, near High Wycombe. It has as its object the fostering of interest in riding generally, and the provision of economical facilities to R.A.F. and W.R.A.F. officers, airmen and airwomen for riding instruction and practice, leading to opportunities to represent the Club at shows and gymkhanas.

The co-operation of several local riding establishments for the provision of horses was readily forthcoming and very soon after the formation of the Club the more experienced members were enjoying jumping practice and hacking in the surrounding countryside and novices were receiving expert instruction in the paddock.

During the past sixteen months mounted parties of Club members have visited numerous Chiltern beauty spots and have thus become fully acquainted with the many attractive bridleways in the Buckinghamshire countryside at all seasons.

Members of the Club who hunted with the Old Berkeley (West) Hunt during the past season included Air Vice-Marshal S. C. Strafford, C.B., C.B.E., D.F.C., the President of the Club, Wing Commander R. S. Allen, D.S.O., D.F.C., Wing Commander G. Matthews, Squadron Leader E. R. Parsons and Flight Lieutenant D. White, R.A.F.M.S. A lawn meet of the hunt was held at the Officers' Mess in December, 1948, which was attended by the majority of the members of the Club either mounted or dismounted.

In order to increase the scope of the Club, and particularly to enable it to acquire its own stables and horses, the Club is now to become the nucleus of an Association open to all R.A.F. and W.R.A.F. personnel serving in the United Kingdom. In the near future, therefore, the Headquarters, Bomber Command, Riding Club, will be replaced by a broader organization to be known as "The Royal Air Force Equitation Association," which will have the wider object of providing facilities for equitation instruction, hacking, jumping, hunting and practical experience in horsemastership and stable management. It will also aim to provide training facilities and mounts for the Royal Air Force Modern Pentathlon representative team, and to train and enter representative R.A.F. teams and/or individuals in appropriate competitions. Immediately the Club is on its feet it also plans to hold its own local gymkhana.

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CURRENT EVENTS

Farnborough Flying Display

BRITAIN LEADS THE WORLD

FROM 6th to 9th September The Society of British Aircraft Constructors staged at Farnborough the biggest air show of its kind in the world. They gave convincing proof that Britain once again leads the world in design and production of aircraft.

It would be difficult to say, from an air force point of view, which of the many types demonstrated was of the greatest interest, as so many of the sixty-two types were potential service aircraft; even the commercial air liners have their possible military transport uses.

The First Jet Bomber

The first visit was probably to the Canberra, the twin-jet bomber with which the R.A.F. is to be rearmed. To describe any war weapon with such potentialities for destruction is this one, as "lovely," may seem a contradiction of terms, yet to an airman, on seeing its beautiful clean lines, it would be no more than an apt description. Although the details of the performance of this bomber are still secret, the fact that it is powered by two Avon jet engines (the most powerful turbo-jet engine in existence) led one to expect great things from its flying demonstration. It came up to expectation. Its take-off, almost "rocket-like," was spectacular, the manœuvrability at high speeds was astonishing and at low speeds it lost nothing of its controllability. The ease with which it performed evolutions, such as rolls, showed that it handled almost like a modern fighter aircraft. With the need to keep its maximum speed secret, it is unlikely that during the demonstration it was flown at full power; that it is capable of speeds approaching 500 m.p.h. has been announced already. This bomber will take some intercepting by even the most modern known fighters.

Fighter Aircraft

When fighter aircraft were demonstrated, the general tempo of speeds increased noticeably in the flying programme. The latest version of the standard Meteor (that with the two Derwent turbo-jet engines) gave a performance that was spectacular in its speed of climb and manœuvrability at high speeds. Nearly all the pilots demonstrating jet fighters tore across the airfield at a height of a few feet and then climbed steeply, doing a number of upward rolls during the climb. When the Gloster Meteor did this it seemed practically to disappear. Within a few seconds it had reached a height of between 7,000 and 8,000 feet and eventually could be only dimly discerned as a speck in the sky.

An even more outstanding single-seater fighter was the Meteor, powered by two Rolls-Royce Avon turbo-jet engines. In view of the growing anxiety regarding the interception of modern bombers, it would be interesting to test this aircraft with the Canberra, also powered by similar engines. The results of such a test would be most interesting. The operational performance of fighters will be greatly improved by the incorporation of the "re-heat" or "after-burning" system, which enables the pilot to obtain greatly increased power when he needs it, whether for increased climbing speed or combat powers.

A much-needed replacement in the air forces is a two-seater fighter; therefore,

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great interest centred round the De Havilland Vampire night fighter (D113), a two-seater fighter with a Goblin turbine of 3,500-lb. static thrust.

Two more new types of fighters were demonstrated, both with swept-back wings, the Vickers P510, which has one Nene Mk. 2 turbo-jet, and the Hawker P1052 with a similar engine; this, in outward appearance, was identical to the Hawker naval fighter. These aircraft, which approach the speed of sound in level flight, are alleged to become supersonic in a dive. Another, just off the secret list, is the De Havilland Venom (D.H.112), with a Ghost turbo-jet engine producing 5,000 -lb. static thrust. In a dive past the thousands of spectators, the commentator announced that the speed of P510 at that moment approximated to 650 m.p.h. The flying demonstration of both of these aircraft was an outstandingly good show, as was that also of the Wyverne 2, a naval striker fighter, powered by a Python turbo-propeller engine giving the equivalent of 4,000 h.p.

The World's First Jet Air Liner

Among the commercial aircraft, many of which could be adapted for military transport, was the world's first jet air liner, the Comet, a thirty-six-seater, with four De Havilland Ghost turbo-jet engines, and for an aeroplane with a speed of 500 m.p.h. at 10,000 feet, it was surprisingly quiet in flight. The beauty of its lines brought much admiration from the spectators. Britain certainly leads the way in this sphere of aviation, as no other nation has planned or built anything similar.

The twenty-two-seater feeder-liner transport Marathon II, powered by two Mamba turbo-propeller engines, made a remarkably short take-off, estimated at about 700 yards; it is said to climb at 2,300 feet a minute and cruise at 255 m.p.h. at 10,000 feet.

General Observations

It was impossible, in so vast an exhibition, to see everything in one day, and even five days are inadequate to absorb the multitude of information that this show offers. Between 1000 hrs. and 1200 hrs. it meant a fleeting visit to each of the sixty-two aircraft before they were removed to the airfield; the time left, before the flying display commenced at 2.30, was insufficient to obtain lunch and visit the exhibits of absorbing interest in the hangars. A hurried visit to see the new supersonic rocket made one wish to see more. This rocket, twenty feet long, which burns liquid oxygen and alcohol, develops a thrust equal to 2,800 h.p. and is launched from a ramp by another "booster" rocket which it discards in flight, attains a speed of 1,100 m.p.h. Although used for supersonic experiments, that it could be developed for other purposes is obvious. The Americans, who specialize in rocket experiments, have the Martin Viking rocket, which is alleged to travel at 2,250 m.p.h.

Lack of space prevents an inclusion of other exhibits, other aircraft, or details of the interesting display by the helicopters (particularly the Sikorsky 51), but such aircraft which have a particular interest to air forces have been dealt with. Summing up the new designs it seemed that fuselages are increasing in size, with a corresponding decrease in the size of power units.

This year's display was first-class, not only of Britain's supremacy in design and construction, but of the skill of our pilots. The show was a triumph for The Society of British Aircraft Constructors, who should feel confident in reaching the Board of Trade target of £33,000,000 worth of aircraft exports.

The only part of it which left anything to be desired was the arrangements for their guests' luncheon. Another time they would be well advised to take picnic baskets, thereby providing a better lunch, removing a blot on their enjoyment,

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and allowing at least an hour and a half longer to see the many things offered to interest them.

Aircraft

R.A.F. RE-EQUIPMENT OVERSEAS

CONSIDERABLE progress has now been made with the re-equipment of R.A.F. squadrons overseas. Jet aircraft have replaced piston-engined types in a number of fighter squadrons, and other units are also receiving modern replacements for war-time aircraft.

Three of the fighter squadrons in Germany now have De Havilland Vampire 5 jet fighters, and squadrons in Malta and Cyprus have the Vampire 3.

A new R.A.F. light tactical bomber, the Bristol Brigand, is in service in Iraq, and will re-equip squadrons at Aden and Kuala Lumpur, Malaya, during the next two months. A meteorological flight of Brigand aircraft has been formed at Negombo, Ceylon.

The Vickers Valetta (the R.A.F. version of the Viking air liner) has started to replace the veteran Dakota in medium-range transport squadrons in the Middle East. Five Dakota squadrons are due to be re-equipped with Valettas in the next six months.

* * * *

GENERAL ITEMS OF NEWS

New R.A.F. Defence Unit

A Fighter Control Branch for alerting and co-ordinating the country's defences and directing fighters by radar has been set up on a permanent basis in the R.A.F. This will make available seventy-two more officer vacancies for members of the R.A.F., W.R.A.F. and National Service men, who, after twenty-four weeks in "on the job" training, will fill fully productive officer posts. Some pilots from Fighter Command will do tours of fighter control duties to keep the organization abreast of fighter tactics and to keep the General Duties Branch in close touch with fighter control.

Refresher Courses for Officers returning to the R.A.F.

A course for this purpose has been opened at R.A.F. Station, Spitalgate, Lincs, to bring up to date a returning officer's knowledge of subjects common to every branch of the R.A.F., emphasis being placed on traditions and customs of the Service, etiquette and bearing.*

Longer R.A.F. Staff College Courses

R.A.F. Staff College courses, at present of nine months' duration, are to be increased to a year, at Bracknell from next January and at Andover from May.

Speed Record for Model Aircraft

A 20-oz. model aeroplane which reached 120 m.p.h. at North Sydney Oval recently set a new Australian open speed record for its class. The previous record was 116 m.p.h., made at Bankstown last year. The plane is owned by Mr. J. Finneran, acting President of the Model Aeronautical Association of New South Wales. The model is a 17-inch wing span aluminium craft powered by a motor developing half-horse power.

*With all due modesty, we feel that a most useful handbook for the staff and pupils of this course would be *Customs of the Services* (Gale & Polden Ltd.; 5s.), written specifically for this purpose.

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Rockets may be Made in Australia

It is reported that the Fairey Aviation Co. Ltd. will carry out research on anti-aircraft rockets and guided missiles in Australia, in co-operation with the Australian and British Governments.

A spokesman for the company says that the exact nature of the research cannot be divulged. However, it is considered likely that the Ministry of Supply will make and test the missiles on the Australian range after the company has completed research.

A young Australian, Colonel R. T. Elvish, has been appointed manager of the Australian section of the Fairey Aviation Company's research division.

* * * *

MIDDLE EAST

Middle East Talks

The First Sea Lord, the C.I.G.S. and the C.A.S. were recently called to a meeting at the Foreign Office of British diplomatic representatives to the Middle East countries. Their presence makes it certain that one of the items on the agenda was the question of security and the problems raised by the elimination of Palestine as a British base. Mr. Bevin presided during the early stages of the meeting which was held to review British long-term policy in the Middle East.

* * * *

THE FAR EAST

Station's Own Broadcasting System

The officers and airmen at R.A.F. Station, Tengah, near Singapore, have perfected the station's latest amenity, a broadcasting system of their own, linking each barrack block in the unit.

The programmes begin with music from 6.45 to 7.30 a.m., are resumed from 12.45 to 1.30 p.m., and are continued in the evening from 6 to 10 p.m.

The programme directors encourage "live" broadcasts, sports talks, quizzes, and personal request programmes, one of which includes records played at the request of wives and relatives in the United Kingdom.

Well done, Tengah! Jolly good effort.

Beauty Spot as Leave Centre for Airmen in Hong Kong

Through the generosity of its owner, a Chinese resident of Hong Kong, the airmen of R.A.F. Station, Kai Tak, have been given the use of a seaside house and its grounds as a leave centre.

Situated at a well-known beauty spot, Silverstrand, the leave centre stands on high ground overlooking an inlet of the sea on the east coast of the Kowloon peninsula. A hundred and fifty feet below is a small, sheltered cove, with a pleasant, sandy beach, where the airmen can swim, laze and sunbathe amid scenery reminiscent of parts of Cornwall.

In these surroundings it is difficult to realize that this pleasant retreat is only seven miles from the crowded city of Kowloon and the busy "joint user" airport of Kai Tak.

The house contains sufficient room to accommodate twelve airmen, and another eight can be accommodated in tents in the grounds. No charge is made for airmen visiting the camp, and service rations are provided.

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Parachutists being inspected by H.R.H. The Princess Elizabeth, Duchess of Edinburgh, at the Royal Tournament, Olympia

[Photos: Gale & Polden Ltd.

R.A.F. police and their police dogs at the Royal Tournament, Olympia, awaiting their entry

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ROYAL TOURNAMENT

By Group Captain H. Waring

PARACHUTE DISPLAY

FOR the first time the complete sequence of parachute training was demonstrated under a roof. First, pupils in teams of twelve displayed the art of distributing the force of landing to parts of the body most capable of accepting the shock. Speed and height were added to the landings by the use of portable ground training apparatus.

Next, parachute jumping instructors leapt from a platform and sped down cables, hanging from trollies, to land in the arena at a given point. Many landings were more spectacular than intended, as a whip in the cable occasionally occurred at an inopportune moment.

Continuity of the training was maintained as the three balloons ascended with two men in each balloon car. In turn they demonstrated the art of stepping into space and the correct drill in falling.

The climax was reached when six parachutists were simultaneously lifted to the roof of Olympia, where six coloured parachutes were already open to receive them. They attached their harness and in quick succession were released to descend most realistically to the arena.

The success of this event was greatly helped by the excellence of the broadcast commentary, which described step by step the progress of the trainee under instruction, culminating in the climax of the live descent.

The event brilliantly achieved the difficult task of being informative, interesting and spectacular, and it demonstrated the thoroughness and efficiency of the training given at the school.

"POLICE DOGS ON PARADE"

The purpose of these dogs is to safeguard property in deserted areas. As they operate by detecting human scent, obviously the restricted space of the arena and the presence of some 10,000 spectators made it impossible to demonstrate their operational role. A programme was therefore devised to show examples of obedience training and some diversionary entertainment in a lighter vein.

Demonstrations of individual and mass tackling of fleeing culprits, the part played by a dog during the search of a suspect, and massed obedience drill by forty dogs formed the more serious side of the display. On the lighter side was an entertaining display of hurdle and hoop jumping, together with amusing variations by individual dogs.

In the drill what impressed spectators most was the instant obedience of the dogs to the taps on the drum without any words of command from their masters.

The final march past the Royal Box, led by the commanding officer of the unit, Flight Lieutenant R. D. Cooper, and Leading Air Dog "Storm," was both smart and impressive, and it was obvious that the animals enjoyed themselves as much as, if not more than, their masters.

CONCLUSION

This year the Tournament was an outstanding success, as evidenced by the record attendance and takings. The Royal Air Force played an important and praiseworthy part in contributing towards that success. It is to be hoped that the Royal Air Force will continue to participate and earn even higher praise in future years.

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In the right centre (wearing a beret) *can be seen Squadron Leader Willott, who created an all-time revolver record with a score of 108 out of a possible 120. He is discussing some of the final scores with Lord Tedder, who is a staunch supporter of the R.A.F.S.A.A.*

R.A.F. Bisley Meeting, 1949. The picture shows the strong support given to this Meeting by Air Officers of the Royal Air Force, no fewer than seventy-five attending on the last day. In the third row from the front, seated in the centre, is Lord Tedder, with Lord Trenchard on his left and the future Chief of Staff, Sir John Slessor, on his right. That so many distinguished officers, with heavy responsibilities, found time to visit this Meeting, is an indication of the importance attached to encouraging the R.A.F.S.A.A. That 1,400 R.A.F. competitors created a record attendance for any Service meeting shows that this support is well merited

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THE R.A.F. BISLEY MEETING, 1949

By Air Vice-Marshal W. E. Staton, C.B., D.S.O., M.C., D.F.C.

IN many ways this was an historic occasion. Never before in the history of Bisley have the ranges been so extensively covered with the blue uniforms of the R.A.F.

No less than 1,400 competed in this year's Championship Meeting, creating a record attendance for any Service meeting ever held at Bisley. For the first time members of the W.R.A.F. were among the competitors.

Its success must be attributed to the good will, team spirit and sportsmanship of the many thousands who trained at their stations, spending their evenings and week-ends on the open ranges for months, in order to qualify at their own Command Championships for the right to shoot at the Bisley Meeting, with the hope of being selected for the Imperial Meeting.

Keen interest and increasing support were most noticeable among high-ranking officers of the R.A.F. Despite their arduous duties, the most distinguished officers found time to show their personal interest by attending on the final day. Among those present were Lord Trenchard, Lord Tedder and Sir John Slessor, who were accompanied by no fewer than seventy-two Air Marshals, Air Vice-Marshals and Air Commodores from the various Commands of the R.A.F.

The results of the championship are already well known to all, and, therefore, it only remains to express appreciation of the efforts of all those who contributed to the success of this annual meeting: the Commanders-in-Chief and Heads of Departments at the Air Ministry, who made it possible to plan a meeting that enabled us to compete efficiently on an inter-Service basis; the Group, Station and Unit Commanders who williingly carried on with a temporary loss of man power and contributed to the expenses from their non-public funds; the Committee and its co-opted members, without whose hard work the meeting could not have been held; those toilers behind the scene who worked sixteen hours a day preparing, cooking and serving meals for 2,000 competitors and staff; the statisticians, who worked day and night on an unbelievable number of statistical calculations; and, finally, those who operated the targets with as much precision at the end of a twelve-hour tour of duty as at the beginning. To this R.A.F. teamwork we owe the success of the meeting.

The outstanding personal achievement was that of Squadron Leader Willott, who created an all-time revolver record with a score of 108 out of a possible 120.

It is hoped that every officer and man realizes the ultimate importance of his efforts, not only on the R.A.F.S.A.A., but the Air Force as a whole. Many a Battle of Britain pilot and member of a bomber crew added to their general flying proficiency on the rifle and revolver range. Lord Trenchard gave expression to this very potent point so long ago as his prize-giving speech in 1927.

One of the most important of the many reasons for the success of the R.A.F. in the shooting world has been the encouragement and splendid example set by Lord Tedder. When he has handed over his present heavy responsibilities as Chief of the Air Staff, those who have known him on the ranges for the past quarter of a century are sure that in subsequent years he will still be found chat-

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ting "shooting" to officers and airmen alike at Bisley. His presence will be for ever welcome.

We are also fortunate that his successor is to be Sir John Slessor (President of the R.A.F.S.A.A.), whose sustained interest has contributed greatly to ever-increasing interest and past successes of the R.A.F. in the shooting world. His new appointment will ensure the continuance of a directive force from the highest level.

CONCERNING PERSONNEL

HONOURS AND AWARDS

THE following awards were included in the King's Birthday Honours List:

K.C.B. (MILITARY)

Air Chief Marshal Sir JAMES ROBB, K.B.E., C.B., D.S.O., D.F.C., A.F.C.

C.B. (MILITARY)

Air Vice-Marshal R. IVELAW-CHAPMAN, C.B.E., D.F.C., A.F.C.
Air Vice-Marshal F. J. MURPHY, C.B.E., M.B.
Air Vice-Marshal R. L. RAGG, C.B.E., A.F.C.
Air Vice-Marshal F. N. TRINDER, C.B.E.
Air Vice-Marshal K. B. LLOYD, C.B.E., A.F.C.
Air Vice-Marshal A. MACGREGOR, C.B.E., D.F.C.
Air Commodore J. W. F. MERER.
Air Commodore R. N. WAITE, C.B.E.

D.B.E. (MILITARY)

Air Commandant F. H. HANBURY, M.B.E.

C.B.E. (MILITARY)

Group Captain G. E. WATT, A.F.C.
Group Captain G. A. G. JOHNSTON.
Group Captain G. SILYN-ROBERTS, A.F.C.
Group Captain G. D. STEPHENSON.
Group Captain G. P. S. POLLARD, O.B.E.
Group Captain F. F. RAINSFORD, D.F.C.
Group Captain H. SELDENBERG-SEYMOUR.
Group Officer Lady SETON.

The King has been graciously pleased to approve also the following awards:

BAR TO DISTINGUISHED FLYING CROSS

Flight Lieutenant KENNETH HAROLD FRANCIS LETFORD, D.S.O., D.F.C., No. 88 Squadron.

GEORGE MEDAL

Pilot I RICHARD COLBOURNE, No. 23/151 Squadron.

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ROYAL AIR FORCE PROMOTIONS AND APPOINTMENTS

Among the promotions and appointments announced by the Air Ministry since the issue of the last number of this journal were the following :

To Air Vice-Marshal

Acting Air Vice-Marshals C. B. R. Pelly, C.B.E., M.C., D. A. Boyle, C.B., C.B.E., A.F.C., and H. G. White, C.B.E.

Air Commodores Sir Harry Broadhurst, K.B.E., C.B., D.S.O., D.F.C., A.F.C., and D. MacFadyen, C.B.E.

To Acting Air Vice-Marshal

Air Commodores C. McC. Vincent, C.B., D.F.C., A.F.C., J. A. Gray, C.B., C.B.E., D.F.C., G.M., and L. J. V. Bates, C.B.E.

Group Captain James Warburton.

To Acting Air Commodore

Group Captains H. H. Brookes, D.F.C., and H. H. Chapman.

Air Ministry

Air Chief Marshal Sir John C. Slessor, G.C.B., D.S.O., M.C., to be Chief of the Air Staff, on the retirement of Marshal of the Royal Air Force The Lord Tedder, G.C.B., D.C.L., LL.D., 1st January, 1950.

Air Vice-Marshal A. C. Sanderson, C.B., C.B.E., D.F.C., as Director-General of Personnel I.

Air Vice-Marshal D. A. Boyle, C.B., C.B.E., D.F.C., as Director-General of Manning.

Air Vice-Marshal D. MacFadyen, C.B.E., as Assistant Chief of the Air Staff (Policy).

Air Commodore H. I. Cozens, C.B., A.F.C., as Director of Plans.

Air Commodore R. L. Phillips, C.B.E., as Director of Radio.

Air Commodore H. H. Brookes, D.F.C., as Director of Flying Training.

Fighter Command

Air Vice-Marshal C. McC. Vincent, C.B., D.F.C., A.F.C., as Air Officer i/c Administration.

Transport Command

Air Vice-Marshal J. A. Gray, C.B., C.B.E., D.F.C., G.M., as Senior Air Staff Officer.

Maintenance Command

Air Vice-Marshal L. J. V. Bates, C.B.E., as A.O.C., No. 40 Group.

Air Commodore H. H. Chapman as S.A.S.O., No. 43 Group.

Reserve Command

Air Commodore W. J. M. Akerman, C.B.E., as A.O.C. No. 65 Group.

Group Captain E. M. Donaldson, D.S.O., A.F.C., to command the A.T.C.

No. 90 (Signals) Group

Air Commodore C. A. Bell as S.A.S.O.

Far East

Air Vice-Marshal R. S. Blucke, C.B., C.B.E., D.S.O., A.F.C., as Air Officer i/c Administration, Air Command.

Air Vice-Marshal F. J. W. Mellersh, C.B.E., A.F.C., as A.O.C. Air Headquarters, Malaya.

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This Dakota is shown at Arctic Bay, in Northern Baffin Island, picking up the seriously ill wife of a Department of Transport officer

Checking final details before an aerial photographic flight. (Left to right) *are Flight Lieutenant J. O. Levesque (co-pilot); Flying Officer H. G. Smiley (radio-operator); Flight Lieutenant N. D. Cairns (captain); Leading Aircraftman B. H. Trevetham (crewman); Flight Lieutenant R. Wood (navigator and officer i/c detachment)*

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THE COMMONWEALTH AIR FORCES

ROYAL CANADIAN AIR FORCE

POST-WAR HISTORY

SOME details of the history of the R.C.A.F. from its origin up to the end of the Second World War were published in the July number of this journal, and some details of happenings since the end of the war were promised for the October number of THE ROYAL AIR FORCE QUARTERLY.

In the limited space available, only the outline of the absorbing story behind the post-war operations and training can be given. Many of the incidents referred to so briefly are a story in themselves, and it is hoped in later issues to publish some of them.

PERSONNEL

Planners for the peace-time R.C.A.F. realized the impossibility of Canada maintaining an Air Force approaching in size the war-time force. It is designed now as a relatively small but highly trained nucleus, capable of providing immediate interceptor defence, and able to expand rapidly in event of emergency.

In 1946 this called for 16,000 officers and men; in addition, 2,000 more were authorized for extraneous commitments, such as the search and rescue organization and photographic survey operations. In December, 1948, this ceiling for personnel was lifted and present recruiting is not linked to this maximum. Units already in operation include maritime, transport, interceptor, communication, fighter-bomber, photographic survey and air observation post squadrons. There are in addition search and rescue and transport support flights. As the first-line reinforcement for the Regular Force stands the R.C.A.F. (Auxiliary), ten squadrons of which are already in existence.

Revision of the plan for further emergency expansion by the R.C.A.F. (Reserve) is now taking place. This pool of partially trained personnel was originally set at 10,000 for the active classes and an unlimited figure for the inactive group.

Closely associated with the R.C.A.F. is the Air Cadet League of Canada, whose squadrons have a maximum approved enrolment of 15,000, and of these 177 squadrons are now in being.

AIRCRAFT

For *ab initio* training, Harvards are now in use and twin-engined training is carried out on Expeditors. Squadrons are armed with Vampire Mark III and Mitchell aircraft, and new aircraft include the Vampire jet fighter, the four-engined North Star transport and the Sikorsky S51 helicopter. Future aircraft

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include the American F86 jet fighter and the all-Canadian, two-seater, long-range jet fighter.

TRAINING

A description of the normal training for war of R.C.A.F. squadrons would be a repetition of that taking place in R.A.F. squadrons, and therefore well known to most readers. Therefore it is proposed to describe other forms of training and operations peculiar to the R.C.A.F.

In September, 1948, Canadian Service colleges (Royal Roads and the Royal Military College) were taken into use as tri-Service establishments to train young officers for the Armed Forces, each providing a four-year course at university level. During the summer months Air Force cadets take sixteen weeks' training at an R.C.A.F. station. A similar summer flying training plan is operated for undergraduates at other Canadian universities contemplating a career with the R.C.A.F. At seven major universities there already exist as well R.C.A.F. Auxiliary university flights. The latest training establishment is a survival training school at Fort Nelson, within the Arctic circle, where aircrew are instructed in methods of bush and Arctic survival. The staff is composed of experienced R.C.A.F. personnel, Eskimos and Indians. To enable airmen forced down in remote northern areas to survive, they are not only taught all survival techniques but given a course in different Eskimo and Indian languages.

In addition to fitting itself to serve as an efficient defence force, the R.C.A.F. has various "peace-time" tasks which serve the public interest and at the same time give personnel operational training. Greatest of these is the aerial photographic coverage of Canada. In 1948 more than 911,000 square miles were photographed, which included extensive photography from the air of Canada's Arctic islands. In addition to such achievements as the discovery of lost or uncharted islands, other photographs serve as a basis for geology and maps, opening new mining areas. They also assist in forest inventories, being used for calculating timber in a given area. Irrigation, hydro-power development, town planning, land reclamation, control of soil erosion, and transportation surveys are all assisted by such aerial pictures. Each year the frontiers of Canada roll back a little, and Canadians know more about their great area in the north.

Important also among the peace-time responsibilities of the R.C.A.F. is their search and rescue organization, which not only renders aid to aircraft in distress on their east and west coasts, but renders assistance to aircraft lost in their vast tracts of land. In the twelve months ending 31st March, 1949, this organization took part in 116 different search and rescue operations and its aircraft flew more than 2,500 hours on these errands of mercy. Much credit for the success of these operations should be given to the signals organizations of the Armed Services, without which the work could not be carried out.

The year's total includes forty-two cases where the search was for civil or military aircraft, thirty-five were assistance given to marine craft, twenty-eight "mercy flights" and eleven others. An example of the tenacity of the searchers under the most trying flying conditions was that for the U.S. Navy Beechcraft last autumn, with the American and British Naval Attachés aboard. It was twelve days before it was located and its five crew members and passengers rescued.

In addition, "unofficial" mercy missions are undertaken by this organization: flying wounded trappers to civilization; dropping supplies to villages in the Far North wiped out by fire; or transporting dying Eskimos from the Frozen North to civilized aid.

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Hand-picked volunteers, selected for their woods experience, physical endurance, general keenness and intelligence, are specially trained in parachute jumps into rugged country, woodsmanship, mountaineering, first aid, and many other subjects. So carefully are they trained that every one of them could, if the occasion arose, deliver a baby.

Also ready for search and rescue work are the vessels and men of the R.C.A.F. Marine Section; with their high-speed rescue launches, capable of making over 40 m.p.h., they are ready to streak out of the harbour to lend aid where needed.

OTHER OPERATIONAL FLYING

Apart from these specialized organizations, other notable flying achievements have been accomplished by the R.C.A.F. During last year a Canso amphibian carried out sustained operations in the heart of the Arctic archipelago, defying hazardous flying conditions to allow civil scientists to obtain magnetic data for fixing the present position of the Magnetic North Pole.

An elaborate network of scheduled transport flights from coast to coast, and into the Far North, has been maintained by Nos. 426 and 435 Transport Squadrons. The former squadron, flying North Stars, has carried out transatlantic flights, making trips between Dorval and Lyneham, England.

A special Lancaster flight was undertaken over the North-West Territories to allow scientists to estimate the number of caribou—vital to native populations in many parts of the country in that region.

One of the most interesting activities has been flying the "Rockcliffe Ice Wagon," a single-fin Liberator for research by scientists into problems of icing. This has deliberately headed into the worst flying conditions available, to obtain first-hand data. Not only R.C.A.F. but R.N., R.C.N., and R.A.F. aircraft are tested for cold-weather performance at the Winter Experimental Establishment at Edmonton, which has already contributed materially to Service knowledge of cold-weather flying and maintenance.

CONCLUSION

It is not possible to do justice to so great a story of achievement in so brief a summary of the day-to-day events in the R.C.A.F.

Yet the magnitude of their task is clear, without stressing the vast distances covered in climatic conditions never experienced by most of our readers.

Concurrently with their normal training for war, they undertake duties invaluable to that training and of inestimable value to their country and the world.

Their photographic-survey squadrons' discoveries, the numerous lives saved by their search and rescue organization, and their hazardous operations into the far Arctic have brought world-wide attention.

Only a very high standard of training of both ground personnel and aircrews alike could have made possible the successful operations which have been carried out from year to year since the end of the last war.

Clearly efficiency is the keynote in building this post-war force. It never stands still, it is always reaching for perfection. Today it flies over Canada, from the southern border to the far Arctic, as Canadians carry on in the skies, building a new Air Force, with new concepts and new aircraft, drawing the veil from their great lands in the north, aiding in making Canada a mightier nation, working not only for Canada's security but for the peace of the world.

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SOUTH AFRICAN AIR FORCE

Brigadier J. T. Durrant, C.B., D.F.C.,
Director-General of Air Force

MESSAGE OF GREETING

FROM BRIGADIER J. T. DURRANT, C.B., D.F.C., DIRECTOR-GENERAL OF THE SOUTH AFRICAN AIR FORCE

To send greetings on behalf of the South African Air Force to a publication like "The Royal Air Force Quarterly" is indeed a pleasure, particularly when such a message is to commemorate the issue of a new series of this fine magazine. We had the privilege of receiving a similar message from "The Royal Air Force Quarterly" on the occasion of the first issue of our own journal, and it is with satisfaction that we now reciprocate that greeting. You are to be congratulated on your new edition, which promises to serve an even more useful purpose than its predecessor. Any endeavour which is aimed at cementing the already strong bonds which exist between the Air Forces of the Commonwealth is worthy of our unstinted support.

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THE CENTRAL FLYING SCHOOL

By Captain W. A. T. Johl, S.A.A.F.

At an altitude of 5,000 feet above sea-level, at the eastern end of the Witwatersrand in the Transvaal, is the Central Flying School, which meets all the needs of pure flying training in the South African Air Force.

During its location at Bloemfontein in the Second World War its functions were more like those of the C.F.S. in the Royal Air Force, in that it specialized in the training of flying instructors only, but it has now reverted to its original and wider activities.

The large, grass-surfaced airfield, with its 2,000-yard take-off which adequately meets the adverse effect of its high altitude, is large enough to accommodate every type of aircraft with which the S.A.A.F. is equipped. These include Venturas, Dakotas, Spitfires, Harvards and Tiger Moths; later they are to be supplemented by the addition of Vampires, Devons and Austers.

THE ORGANIZATION

The organization needs to be flexible to compete with the variety of training undertaken and includes the following flights: basic, advanced, service, and instructor training flights; and twin-engined and single-engined conversion flights. But this is not the end of their diversity of instruction, as, from the result of experience gained at the Empire Flying School, additions of handling and research, and instrument weather flights have been made.

All of these flights, for want of a better name, could be termed "ghost" flights, coming into operation only as and when requirements demand their existence. For such flexibility, efficient planning and careful co-ordination are essential, and continuous reallocation of duties is also necessary. The adaptability of the instructors, who maintain a high standard in this wide field of instruction, indeed qualifies them to the uttermost as "General Duties" officers. Never before has a branch title been so applicable or so well earned.

FLYING TRAINING

The training of pilots for the Active Citizen Force squadrons, the counterpart of the Royal Auxiliary squadrons of the Royal Air Force, constitutes a major task for the C.F.S., upon whose output depends the steady growth of this branch of the S.A.A.F. The method of training citizen pilots, scattered so widely over South Africa, will undoubtedly be interesting to the R.Aux.A.F.

The sixteen months' training is divided into four phases. The first, that of ground instruction and elementary flying on Tiger Moths over a non-continuous period of four months, is undertaken at selected civil flying clubs in the pupil's area. The second is one month's continuous training in the Advanced Training Flight at the C.F.S., when pupils are converted to Harvard pilots. The third is eleven months' non-continuous training on Harvards at their civilian flying clubs. For the final phase pupils return to the C.F.S., where after passing out of the Service Training Flight, they receive their "wings," are commissioned in the Special Reserve of Flying Officers, and are then absorbed in the relevant Active Citizen Force squadrons.

To ensure the maintenance of a high standard of both ground and flying

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Lieutenant-General L. Beyers inspects a passing-out parade of pilots

instruction, examining officers from the C.F.S. pay frequent visits to the civilian flying clubs, when all pupils are flight-tested and, when circumstances necessitate, the instructors as well. Opportunities also exist for the latter to attend a short course at the Instrument Weather Flight at the C.F.S.

The weather in South Africa is ideal for flying (real Group Captain's weather !) and it was only during the war and subsequently, when the S.A.A.F. spread its wings farther afield, that the appalling weather conditions in some parts of the world were fully understood, bringing with them the full realization of the vital necessity of efficient training in instrument flying, a sphere of flying training which had hitherto been lamentably neglected in the S.A.A.F. This essential phase of flying training is now included as an important part of the syllabus of the C.F.S.

Other courses at the Central Flying School, such as those for Link trainer instructors, refreshers, conversion and flying instructors, are modelled more or less on the lines of those in the Royal Air Force.

GROUND AIDS TO TRAINING

In the ground training, however, there are innovations which may be different from the usual R.A.F. training, Believing in the old Chinese proverb that "A picture is worth a thousand words," and to give a more practical background to technical training, certain visual "aids" have been introduced. A disused hangar has been converted into an "Airmanship Hall," in which is a display, in bays down each side of it, of armament, navigation, photography, safety and other auxiliary equipment. In the centre are various types of aircraft, which include the F.-W.190, Me.262 and the Fiesler Storch, as well as specimens of engines. At the rear end of this hall are four elaborately equipped Harvard synthetic trainers on stands, which are used for cockpit familiarization during the initial period of conversion on to the advanced trainer.

In the near future the practical side of aerodynamics is being catered for by the installation of a comprehensively equipped aeronautical laboratory, the main item of which will be a three-foot return flow open wind tunnel, powered by a 40-h.p. electric motor, with suitable demonstration apparatus. Other equipment will include a smoke tunnel with a four foot by three foot observation section and a water tray.

CONCLUSION

The Central Flying School has now reached its full stature and the task for the future lies in the improvement of present facilities and techniques in the air and especially on the ground.

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ROYAL NEW ZEALAND AIR FORCE

CONCERNING PERSONNEL

C.A.S. Visits the United Kingdom

The Chief of the Air Staff, Air Vice-Marshal A. de T. Nevill, C.B., C.B.E., recently visited the United Kingdom, where he discussed plans for the re-equipment of the R.N.Z.A.F.

Promotion

Wing Commander C. C. Hunter, O.B.E., is promoted to the temporary rank of Group Captain, with effect from 25th April, 1949.

Appointments

Recent appointments in the R.N.Z.A.F. include the following:

Group Captain F. R. Newell to be Director of Organization and Staff Duties.

Group Captain M. F. Calder to command R.N.Z.A.F. Station, Whenuapai.

Group Captain J. T. Davison, O.B.E., G.M., to be Assistant Air Member for Personnel.

Group Captain R. J. Cohen, A.F.C., to be Deputy Chief of the Air Staff.

Wing Commander F. R. Dix, O.B.E., A.D.C., to be Commanding Officer, R.N.Z.A.F. Station, Ohakea.

Wing Commander R. Webb, D.S.O., A.F.C., to be Commanding Officer, R.N.Z.A.F. Station, Laucala Bay.

Relinquishments

Group Captain A. E. Clouston, D.S.O., D.F.C., A.F.C., R.A.F., has relinquished command of R.N.Z.A.F. Station, Ohakea, on return to the R.A.F.

Group Captain W. C. Sheen, D.S.O., O.B.E., R.A.F., has relinquished the appointment of D.C.A.S. on return to the R.A.F.

Wing Commander J. M. Checketts, D.S.O., A.F.C., has relinquished the command of R.N.Z.A.F. Station, Laucala Bay, and is posted to a course at R.A.F. Staff College.

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DINNER AND DANCE

By Squadron Leader J. M. S. Ross, R.N.Z.A.F.

"FUNAFUTI," translated, means Big Banana. On the map of the Western Pacific it denotes an atoll in the Ellice Islands consisting of thirty coral islets set on a reef which encircles a lagoon some ten miles in diameter. Funafuti Island, which gives its name to the atoll, is a low, flat strip of land shaped as its name implies, seven miles long by a hundred yards wide, except where it bulges in the middle to a breadth of just over a quarter of a mile.

An R.N.Z.A.F. Catalina visited it recently, landing on the lagoon in the middle of a tropical rainstorm. When it rains in the Ellice Islands it is difficult to decide whether one is airborne or waterborne.

We were to spend the night at the house of the District Officer, an Islander, who had arranged an evening's entertainment for us. Also invited for the evening were a dozen officers from H.M.N.Z.S. *Taupo*, which had called in in the course of her winter cruise, a visiting missionary and his wife, and a couple of traders who were passing through.

By the time we assembled at the D.O.'s house the rain had stopped, night had fallen and a full moon was rising behind the palms. Mosquitoes, the curse of tropical evenings, were absent and we stood sipping our pre-dinner gins beside open windows, untrammelled by screens or netting. In a corner a small girl operated a portable gramophone and gave us a continuous flow of jazz.

Dinner was a buffet affair, and enormous. A long table at the end of the room was covered with dishes, native and European, and we helped ourselves as the fancy took us—roast chickens' legs, crab, steak with sweet sauce, mashed potatoes, taro, dalo roots, dalo tops cooked in coconut milk, yams, kumaras, shredded

The District Officer, Funafuti—Mr. Pennitela Toa

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coconut—all to be heaped on a single plate and followed by dishes of fruit salad. Our host was a man of vast appetite and saw no reason why we should eat less than he.

The meal over, he allowed us a torpid, reflective, digestive half-hour and then we went over to the village meeting house for the dance, strolling through coconut palms whose fronds threw black shadows across the white, moonlit coral of the path.

The meeting house was a big, thatched building, its sides open, with hanging mats to be let down when it rained or blew. The floor, raised three feet above ground level, was of packed white coral and covered with fibre mats.

When we arrived the dance was in full swing, or perhaps it was more of a concert than a dance. At each end of the building was a group of men and girls focused on a circle of young men who squatted round a drum. On the outskirts were mothers and children, the mothers gossipping and the children, small, naked, brown bodies, just sitting and solemnly watching. We were led to chairs and benches along the side of the hall, and the show went on. The entertainment consisted of action songs by girls and men, a team from each group taking the floor alternately. Accompaniment was provided by men's voices in a never-ending chant and by the drums, which were merely upturned wooden boxes covered with mats which were beaten with bare hands by the drummers. The resonance and the intricacy of rhythm they achieved were astounding. After an hour or more of this the girls came over to the sidelines and invited us to dance. First up was the *Taupo's* skipper, who worthily upheld the dignity of the Navy, standing opposite his partner, following her gestures and trying, in his white drills, to emulate the undulations of her grass-skirted hips.

We all had our turn, each watched with appreciative derision by his fellows, and then, in deference to our clumsiness and ignorance of local dances, our hosts organized something like the "Lambeth Walk," in which we all joined. Navy whites, Air Force khakis and multi-coloured grass skirts swept perspiring round the floor for a hectic twenty minutes. For those who had never before tried it in latitude 7° south it was a warm experience.

It is a sad reflection on the degeneracy of the white race to say that it finished us for the evening. The party showed no signs of flagging, but we, hot and wilting, made our farewells and returned to our quarters for beer and bed.

FARMING BY AIR

By Squadron Leader J. M. S. Ross, R.N.Z.A.F.

FOR the past year the R.N.Z.A.F. has been carrying out experiments in top-dressing land from the air to prevent soil erosion, treatment which cannot economically be done in any other way.

In the North Island there are seven and a half million acres and in the South Island two million acres which are likely to become eroded unless their fertility can be increased so that it can grow a protective covering of grass or other vegetation.

A three weeks' trial was carried out last May in the Wairarapa district of the North Island, during which a thousand acres were top-dressed with superphos-

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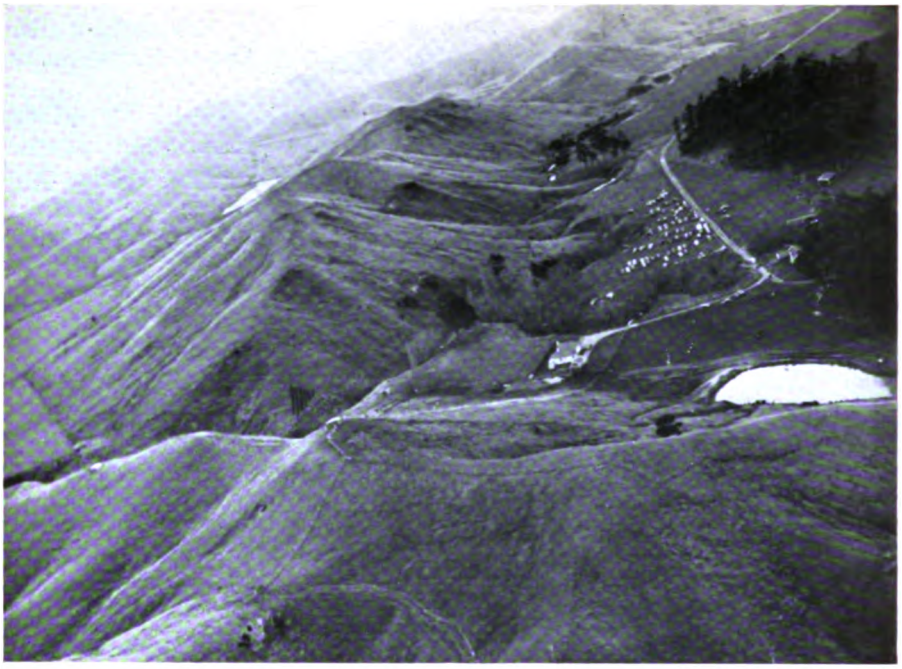

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Scene of the recent top-dressing trials

phate. T.B.F. Avenger aircraft were used, fitted with detachable hoppers in which the fertilizer was carried. Each aircraft carried a ton of phosphate at a time and on each sortie treated a strip of land forty chains long by two chains wide. The phosphate was in the form of pellets slightly larger than a pea, and an even flow was maintained by an electrically driven vibrator which operated automatically when the vents were opened. R/T communication was maintained throughout the operation between the airfield, the aircraft and observers in the dropping area, who reported on the accuracy of the drops and guided the aircraft in. The aircraft flew at a height of 400 feet above the spot heights at 135 m.p.h., and on most runs a very satisfactory standard of accuracy was achieved.

The trial showed that even with Avengers, which are by no means ideal for the job, and with improvised equipment, top-dressing can be carried out from the air efficiently and at a cost which compares well with that of the methods used hitherto. Given aircraft of the right type, capable of lifting six to eight tons, and a fully developed ground organization, the operation can be carried out more economically and its possibilities are immense. If the scheme is developed not only will New Zealand's exportable surplus of food be increased enormously and the evil of soil erosion reduced but the R.N.Z.A.F. will have a job which will provide valuable training for crews and will impress upon the public the fact that, even in peace time, the Services have their uses.

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EDITOR'S NOTES

THE MILITARY APPLICATION OF THE HELICOPTER

OFFICERS of the Royal Navy and the Army will undoubtedly find the above-mentioned article, by John W. R. Taylor, in this number of THE ROYAL AIR FORCE QUARTERLY intensely interesting. The Royal Navy have been quick to realize the possibilities of the helicopter and are given a lead by their admirals, who climb aboard them on their flagships as casually as if they were stepping into a taxi outside the Admiralty.

Other possible uses of these aircraft, in addition to those suggested in Mr. Taylor's article, may have been considered already by the Admiralty, and the Editor would greatly appreciate a further development of this subject by officers of the Royal Navy, either in the form of a "Letter to the Editor" or an article of about 1,200 words, either of which (submitted through the usual channels, of course) would be welcome.

The officers of the Army will have equal interest from the land-warfare angle. The progress now being made in this country and America must open up every kind of possibility for its use in land operations.

Perhaps someone on the staff of the Joint Services Staff College or at Combined Headquarters will be sufficiently intrigued by this article to develop it in directions not covered by the author.

The pooling of ideas (even undeveloped ones) in a journal of this kind, with its wide distribution among the defence forces at home and overseas, could be valuable to planners, who always welcome new ideas. The Editor would very much like to see these columns used as a "Forum of Discussion."

MILITARY HISTORICAL SOCIETY

Those who make a study of military or naval badges, buttons, uniforms or weapons, or naval, military or air force history or traditions might be interested to know that the above Society exists to foster these interests.

The President is Lieutenant-General Sir Adrian Carton de Wiart, V.C., K.B.E., C.B., C.M.G., D.S.O., and the Hon. Secretary is Mr. E. Martin, The Little House, Church Brampton, Northants, of whom all inquiries should be made.

RUGBY UNION

It is regretted that, in the July number of this journal, it was stated in error that Wing Commander J. Lawson, O.B.E., R.A.F. (retired), was the present Hon. Secretary of the R.A.F. Rugby Union, whereas in fact Wing Commander G. R. Howie, D.S.O., of Air Ministry (P12), has been for the past two seasons, and still is, the Hon. Secretary. We apologize for any inconvenience that may have been caused to either of these officers.

CONTRIBUTIONS OF ARTICLES

In recent numbers of this journal there have been some intensely interesting articles on Bomber Command's possible strategy and its functions in any future war, and also an excellent article on "Life on a Bomber Station Today." To make a change for readers we should welcome contributions from Fighter, Coastal, Flying Training, Technical Training, Transport and Reserve Commands and so maintain an even balance of articles on the various functions of the Royal

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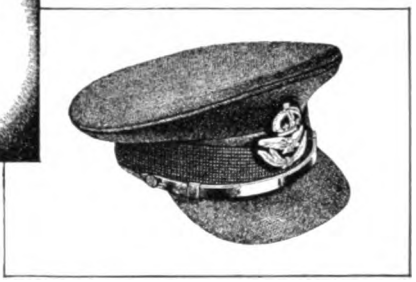

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Air Force. Contributions would be equally welcome from officers of the other Services on matters connected with combined operations.

To write an account of the day-to-day happenings on any station, both in and out of duty hours, would provide interesting occupation for the writer and be of equal interest to those serving on other types of stations.

It might be helpful to know that 750 words with a half-page photograph and a smaller one set in the text fill two pages of the journal. If no pictures illustrate the article, 1,200 words are required. There will, of course, be suitable remuneration.

Similar length articles (preferably with photographs to illustrate them) on "Winter Sports" would be particularly seasonable for the journal issued on 1st January next. There is scope for someone of the Air Ministry Organization Branch to tell us of major and minor changes in organization in the R.A.F. since the war ended. An article of this nature might run to 2,500 words and fill four pages of the journal. "The Functions of the New Secretariat Branch" certainly lends itself to a most attractive illustrated article; the diversity of their duties would make most interesting reading.

Since Pilot Officer Prune was demobilized, a lot of sparkling wit has gone from our lives, and a short article (with suitable illustrations) in a lighter vein would bring relief after the more serious reading.

OPPORTUNITIES FOR RELEASED R.A.F. OFFICERS

We are glad to see that the Air Ministry requires a number of additional air-traffic control officers below the age of 45 by the end of this year. With the present difficulty of finding suitable employment for ex-officers, there is a chance at least for some to obtain short-service commissions for a period of five years. That it is open to released officers of any ground branch or ex-G.D. officers unfit to fly, and offers them a most interesting job, will have been welcome news to a large number of ex-officers.

"Miss New Zealand" (Miss Mary Woodward), at present a guest of the R.A.F.A.

"MISS NEW ZEALAND" NOW A GUEST OF THE ROYAL AIR FORCES ASSOCIATION

We were invited recently to a cocktail party at the Headquarters of the Royal Air Forces Association to meet "Miss New Zealand," who had been invited to this country as a guest of the R.A.F.A. for three months.

First selected by her province (Taranaki), Miss Mary Woodward, was, a few days before her twenty-first birthday, finally chosen out of thirteen others from other provinces, to visit this country as the representative of New Zealand. The qualifications had to cover a wide field—education, sport, personality, youth and beauty, and of her personal charm, having met her, no one could remain in doubt for a moment.

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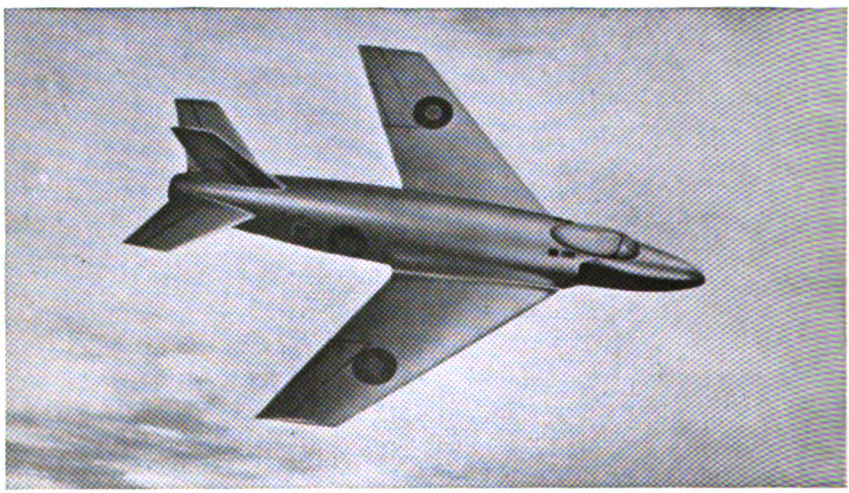
PROGRESS

The Vickers-Armstrong Supermarine 510



"This is the first British aircraft with swept-back main and tail surfaces. Based on the Attacker Naval interceptor, the Supermarine 510 is powered by a Rolls-Royce 'Nene' jet engine." *'Flight'*

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The guests were received by the President of the R.A.F.A., Air Marshal Sir Richard Peck, and Lady Peck. Among those present were Mr. W. J. Jordan (High Commissioner for New Zealand) and Mrs. Jordan, Dame Helen Gwynne Vaughan, G.B.E., Air Chief Marshal Sir John and Lady Slessor, Air Marshal Sir John and Lady Baker, Air Marshal Sir Robert and Lady Saundby, Air Marshal Sir Arthur and Lady Sanders, Air Vice-Marshal Sir John and Lady Cordingly, Air Vice-Marshal Sir Victor and Lady Goddard, Mr. Geoffrey de Freitas, Sir James and Lady Barnes, Dame Katherine Trefusis Forbes, Sir Victor Tait, Air Commodore and Mrs. M. W. Buckley, Air Commodore and Lady Morvyth Benson, Air Commodore and Mrs. Chilton, Air Commodore and Mrs. G. B. Dacre, Air Commodore Ellerton, Air Commandant Dame Felicity Hanbury, Air Commodore and Mrs. Warrington-Morris, the Reverend and Mrs. Leslie Wright, Air Commodore and Lady Daphne Whitney Straight, Miss H. W. Cargill and Group Officer Lady Seton, as well as a large number of other officers of the R.A.F. and W.R.A.F. Also present were several guests from the B.O.A.C., B.B.C., J. Arthur Rank Organization, New Zealand House, Rootes Group Ltd., B.E.A., and the National Council of the R.A.F.A.

After Air Marshal Sir Richard Peck had introduced "Miss New Zealand" to the assembled guests in a few well-chosen words, Air Marshal Sir Robert Saundby explained the purposes underlying the visit by this attractive young representative of New Zealand, and gave us a very brief outline of the programme that had been arranged. Miss Woodward, in a short but charming little speech, thanked all those present for their warm welcome and spoke of the strong friendship that existed between New Zealand and Britain (she is a first-rate ambassadress). Lack of space prevents our giving her programme up to the end of October, but a glance at it would make the most seasoned V.I.P. wonder how he could possibly accomplish it all in the time allotted.

Among the places to be visited are the Houses of Parliament, the Mansion House, the Law Courts, Belfast, Isle of Wight, Windsor and Eton, the Star and Garter Hospital, Salisbury, Exeter, Teignmouth, Hampton Court, Cambridge, Bridgwater, Bristol, Cardiff, Lincoln, Leeds, Harrogate, Blackburn, the Lake District, Chester, Coventry, Westminster Abbey, seaside resorts and a wide tour of Scotland, and at each of these she will take part in luncheons, dinners, cocktail parties, dances, carnivals, regattas, etc. She has indeed a busy time ahead; at the end of each engagement it will be a case of "Little girl, you've had a busy day"!

I imagine there are few people in this country now who do not realize that we must look to our "teeth" if we are to maintain a peace worth having. In these days of power politics, naked and unashamed, the fate of the impotent is tragic indeed, as we have seen within past years . . . our Air Forces, supported by the A.A. guns, are now very literally our first line of defence. Attack from the air is not only the most dangerous threat to which we could be exposed in the event of war; it could develop to a dangerous scale most quickly.

—From an address by Marshal of the Royal Air Force Lord Tedder, G.C.B., D.C.L., LL.D.

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BOOK REVIEWS

AIR AFFAIRS

Briefed to Attack—Malta's Part in African Victory. By Air Marshal Sir Hugh Lloyd. (Hodder & Stoughton; 18s.)

The story of Malta from 1940 to 1944 is a drama in three acts. The first had ended when Air Vice-Marshal Lloyd, as he then was, flew out to the island in May, 1941, as Air Officer Commanding, Mediterranean. When he left Malta in July, 1942, the stage was set for the last act—"the final turn of the tide, when from that gallant little island was directed the first assault on Nazi-occupied Europe." *Briefed to Attack* tells the story of Act Two, the intervening fourteen months that were the heart of Malta's battle.

Previous books have tended to concentrate on the defensive aspect of Malta's struggle; but the battle was never purely defensive. Before Sir Hugh left England he was told by the Chief of Air Staff: "Your main task at Malta is to sink Axis shipping sailing from Europe to Africa," on the assumption that "no supplies—no Rommel: no Rommel—no campaign in Africa." To achieve this, he soon discovered that he had just fifty-nine serviceable aircraft, twenty-nine of them single-seat fighters.

He did not wait for reinforcements before carrying out his brief, and in June, 1941, aircraft from Malta destroyed and probably destroyed 34,000 tons of Axis shipping. The next month the figure was 83,500 tons; in August it went up to 122,900 tons, plus a destroyer. Sailings and sinkings were confirmed by Maryland pilots, whose brilliant reconnaissance work enabled intelligence staff to keep track of every ship sailing between Italy and North Africa.

It was this massacre of vital supply ships that forced Hitler and Mussolini to the decision that Malta must be eliminated; but even at the height of the ensuing "blitz" the Swordfish and Blenheims continued to take their toll of Rommel's ships. Such was the unconquerable spirit of Malta.

The task of destroying the island was allotted to Kesselring, who, in addition to his regular *Fliegerkorps*, was given a second one from the area facing Moscow, with additions from France and Belgium, a grand total of about 900 aircraft. Against this force Sir Hugh Lloyd was able to muster by late autumn eighty-one serviceable Hurricanes and 117 assorted bombers. To make matters worse, the British aircraft were based on only three airfields on a small island seventeen miles by nine, and only sixty miles from Axis airfields in Sicily. Finally, all supplies had to be brought in by sea, through waters controlled by Axis bombers and U-boats. Well might Sir Hugh have had visions of "being marched through Rome in chains."

Chapters describing the bitter fighting which followed emphasize time and again the intimate, personal nature of the struggle. Aircrew, ground staff, the Army—everyone helped to patch bombed airfields so that the fighters could operate, and to build dispersal pens to reduce damage from blast and bomb splinters. It is because Sir Hugh has captured something of this spirit of co-operation and individual heroism that *Briefed to Attack* succeeds in giving a more true and vivid picture of life on Malta in the Second World War than any of its predecessors.

In one month (April, 192) 6,728 tons of bombs fell on Malta—a figure that can best be appreciated when compared with the 185 tons dropped on Coventry during her worst "blitz" night. Kesselring's bombers just could not miss such concentrated targets, and one by one Malta's scanty resources were destroyed with deliberate thoroughness.

Sir Hugh recalls that often only three serviceable fighters remained by the end of a day's fighting, while anti-aircraft guns were limited to fifteen rounds per gun per day. But Malta's defences achieved miracles, and in April, 1942, no fewer than 190 enemy aircraft were destroyed or probably destroyed, with another eighty-one damaged. By mid-July Kesselring had had enough, and, as the bombing lessened and as convoys began to battle their way through to the island once more, it became apparent that the battle was nearly over.

The siege was not lifted until later, when Montgomery's armies swept across North Africa and on into Italy itself. *Briefed to Attack* leaves little doubt that, but for Malta's heroism, the victory might well have been Rommel's.

J. W. R. T.

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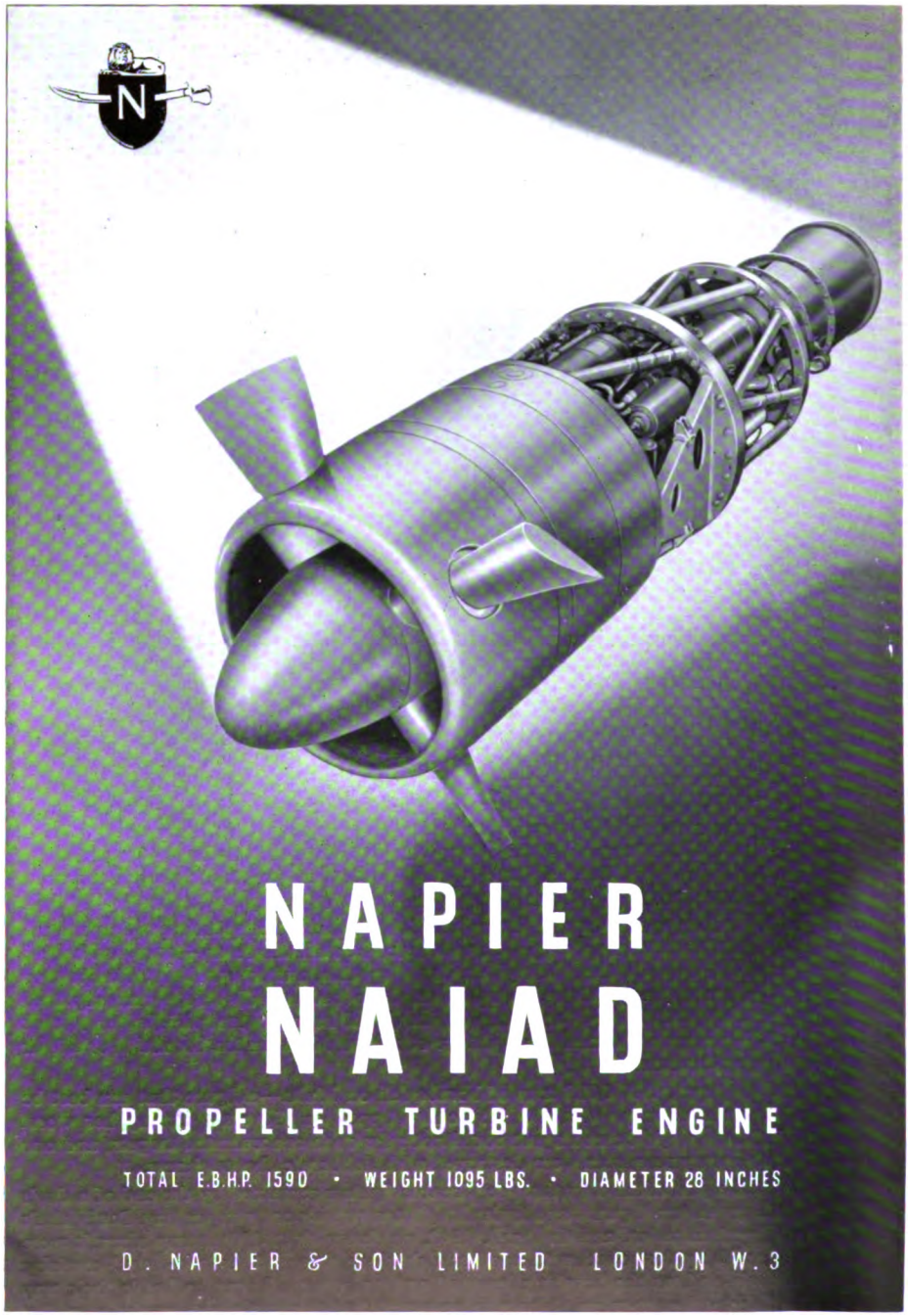
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The Royal Air Force in the World War. Vol. III: The Middle East, 1940-1945. By Captain Norman Macmillan, M.C., A.F.C. (Harrap; 15s.)

In presenting, within the confines of a small volume, a survey of the air war in the Middle East, from the entry of Italy into the conflict until the final battle in April, 1945, the author has attempted a not inconsiderable task. This is the third volume of the series and, like its predecessors, is written in a straightforward, economical style which never becomes prosaic and is eminently readable. It is well illustrated with photographs and describes the major campaigns in the theatre with clarity and a fair perspective.

Captain Macmillan is an accomplished writer on military matters, but after reading this book one may be left with the impression that conciseness has been achieved at the expense of balance. It seems somewhat unfortunate, for example, that out of a text of 250 pages no more than forty have been devoted to the important period from the date of General Alexander's telegram to the Prime Minister announcing the end of the Tunisian campaign to the final victory almost two years later. Following an accurate account of the capture of Sicily, the narrative speeds to its conclusion in summary fashion. Nevertheless, despite the limitations of space, the author has produced an informative and detailed precise account of what was in some respects one of the most interesting theatres of the whole war.

The story of the R.A.F. in the Middle East has become almost legendary. It tells how in the dramatic days of 1940, when everything was in short supply, the air war was fought with near-obsolete aircraft against considerable odds. How the early conquests of Ethiopia and Eritrea were followed by the disasters in Greece and Crete, culminating in the retreat to El Alamein. And then the never-to-be-forgotten advance of the British Eighth Army which spelt the beginning of the end for the Axis Powers.

This was the first action in the war when a British army had air superiority and it may fairly be claimed that, without the efforts of the Mediterranean Allied Air Force, the successful advance would not have been possible. They carried out the policy of winning the air battle before that on the ground was begun. Indeed, as General Montgomery said on the eve of the offensive: "In this battle the Eighth Army and the air forces supporting it are one. They are both operating to one set plan and not two . . . in this I believe lies their great strength. I have always maintained that we are one fighting force. . . ." From the first day of the attack the air forces were in almost continuous action and, with the Navy, were responsible for the disruption of German communications and the prevention of vital supplies reaching Rommel. This severance of the German supply lines was one of the major contributory causes of their debacle.

The North African operations were significant so far as the Air Force was concerned in that they led to the formation of the Tactical Air Force early in 1943. This was the birth of a new conception of the use of air power and as such was one of the outstanding developments of the war. For the first time a clear definition between tactical and strategical application of air power was made. In North Africa the Desert Air Force became known as No. 1 Tactical Air Force, in that it worked in close co-operation with the Army, serving its tactical needs. This was entirely distinct from the original restricted idea of army co-operation. The Tactical Air Force was infinitely larger in scope, embracing short-range offensive operations, the use of fighters and fighter-bombers, reconnaissance and other aircraft. This development led to the formation of two more Tactical Air Forces—one to be used in North-West Europe and the other in Burma.

Bearing in mind the fact that the author had, of necessity, only limited access to the basic sources of material, he has written a book which will more than satisfy the perusal of the casual student and will not fail to interest laymen, particularly those who played their part in a fascinating period of military history.

P. A. W-T.

The Berlin Air-Lift. The Part Played by the R.A.F. (H.M.S.O.; 1s. 6d.)

Although the Berlin air-lift has been the subject of much publicity since its inception more than a year ago, the prevailing theme has usually been political or statistical. The publication of tonnages carried, miles flown and numbers of sorties made, while undoubtedly impressive, scarcely pays adequate tribute to the tremendous feat of organization, administration and airmanship essential to its undertaking. The average citizen, unless he be acquainted with the problems involved, can have no real conception of the difficulties to be overcome. The publication of an official account has long been overdue and the welcome appearance of an excellent booklet from the Stationery Office will suffice to bridge the gap before the comprehensive history of the air-lift is written.

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There has been much varied and critical comment on the R.A.F. during the recent past and the opportunity of doing full justice to their magnificent work on the air-lift should not have been so long deferred. It is not to be supposed that their partners—the Americans—will have neglected to extol their share in it. Never before in the history of the Service has one branch—Transport—been called upon in peace time for an effort of the immensity of the air-lift. Although not faced with the perils of anti-aircraft fire and military opposition, every other hardship and difficulty concomitant with a large-scale air operation has had to be overcome, and this operation has been sustained almost without cessation for more than twelve months.

Mr. Dudley Barker, the author, traces the story from the beginning when the Russian surface blockade became absolute and on 28th June, 1948, the first Dakota, laden with flour, flew into Gatow. And how no one imagined then that Operation "Carter Paterson" was anything but temporary. Only the code word turned out to be temporary, as, when the Russians discovered it to be the name of a famous removal firm, they said that the air-lift was being used for withdrawal from Berlin. The name was then changed to "Plainfare" and the lift grew apace.

The first major problem was the provision of airfield accommodation. The repair and improvement of those to be used entailed considerable work by construction units of the R.A.F. as the numbers and size of aircraft increased with the advent of the Americans. This was followed by the intricate air traffic planning and control necessary to keep the lift flowing in almost perpetual motion. The dead-accurate timing essential is illustrated by the fact that in bad weather if an aircraft failed to land at the first attempt there was no time for a second try. It had to return to base with its load. During the first six months of the air-lift, night and day, an aircraft landed at Gatow every five minutes. The average time between aircraft movements was just over two and a half minutes. There was the tremendous problem of loading, stowing and unloading a complex variety of freight. Fuel, food, machinery and humans, all had to be assembled at the take-off aerodromes and then taken with the utmost dispatch from the three landing grounds in the city in order to make room for the endless stream following behind. From the flying aspect, the weather, as always, was the greatest handicap, but even throughout the severe German winter the lift never abated, owing to superb maintenance and precision flying of the highest order.

There may be, and probably are, those who consider the £200,000 per day cost of the Berlin air-lift to be a waste of fuel, man power and aircraft, but, aside from the humanitarian aspect, there is no doubt that the moral and psychological effect has been incalculable. It has helped to sustain hope in the hearts of millions and perhaps disabused many who were previously contaminated with the insidious doctrine of Communism. It has also represented a major political victory in the "cold war" and a severe setback to the meretricious propaganda and obduracy of Russian foreign policy.

The Stationery Office has produced a most readable account with interesting photographs and excellent diagrammatic illustrations, but, in a mere sixty pages, there is hardly space for more than a bare factual outline of the story. It can tell little of the personal hardships to be overcome—the endless monotony, the sheer hard work and the illimitable patience and skill required. However, no one, reading half-way between the lines, can fail to appreciate the enormity of the demands made upon men and machines. The Berlin air-lift remains a testimony to those qualities which in this past troubled decade have become synonymous with the R.A.F.

P. A. W-T.

NEW BOOKS

AIR AFFAIRS

Airborne Warfare. By Major-General J. M. Gavin (U.S. Army). 178 pp. (Washington: Infantry Journal Press.)

The Air Officer's Guide. Encyclopædia for U.S.A.F. Officers. 582 pp. (Military Service Publishing Company, Harrisburg, U.S.A.)

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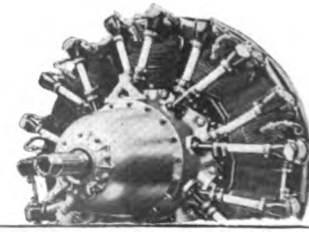

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The War in Malaya. By Lieutenant-General A. E. Percival. 336 pp. (Eyre & Spottiswoode.)
The Rome-Berlin Axis. By Elizabeth Wiskemann. 376 pp. (Oxford University Press.)
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Assault from the Sea. By Rear-Admiral L. E. H. Maund. 311 pp. (London: Methuen.)

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Manchuria since 1931. By F. C. Jones. 256 pp. (Royal Institute of International Affairs.)
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"Economist," 4th June, 1949: "The Price of Admiralty." 16th April, 1949: "Peace and the Bomb."
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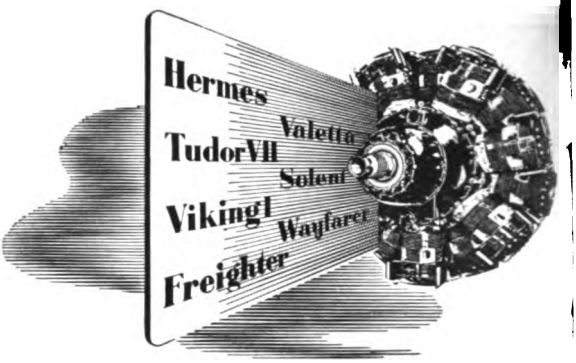

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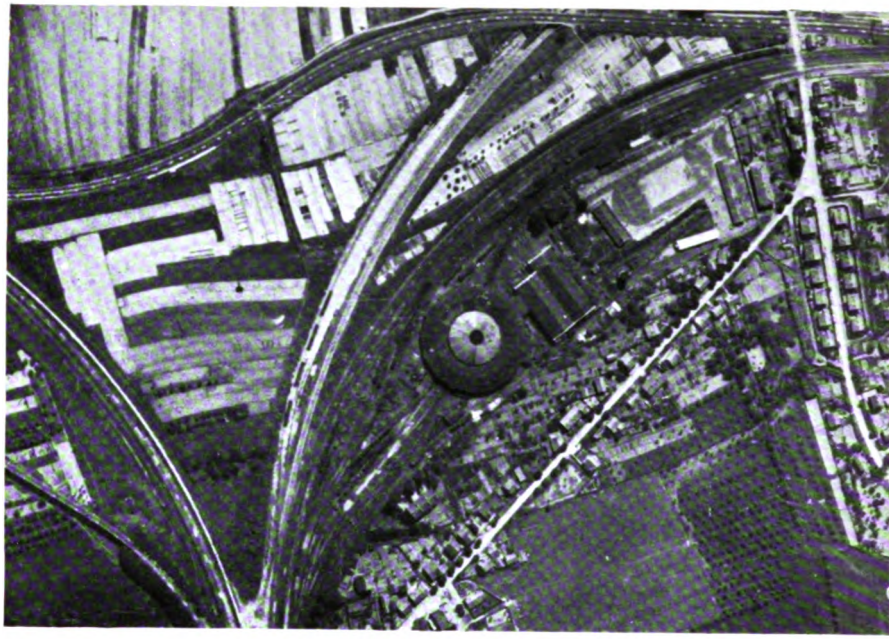

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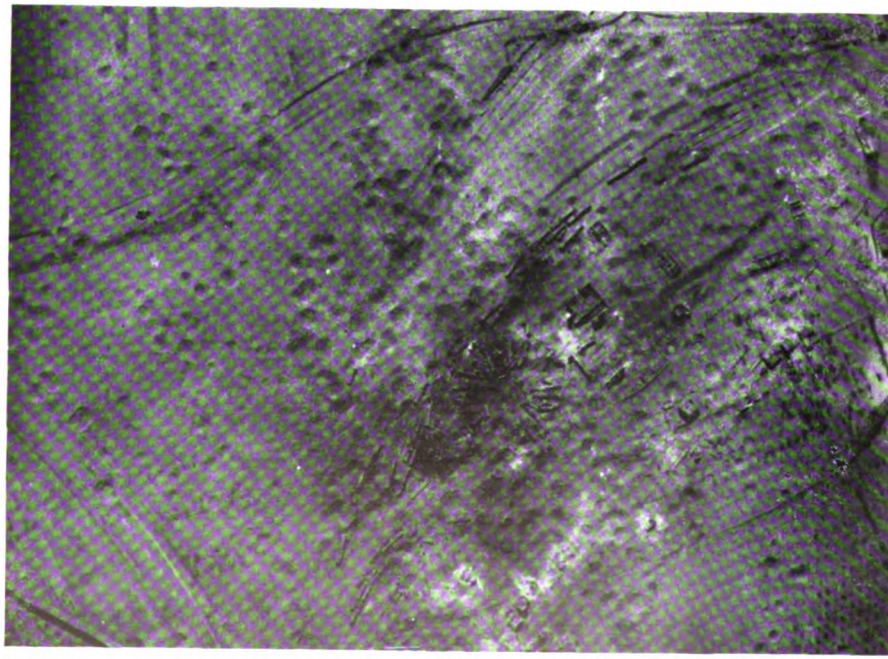

After

The above pictures illustrate how the movements of vast armies of an aggressor can be slowed down and in time immobilized by strategic bombing of vital means of communication. This busy marshalling yard and its engine sheds have been wiped out. This is one example only of the many targets.

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EDITORIAL

THE AIR DEFENCE OF A MARITIME NATION

MANY acrimonious articles have been written recently on the use of air power, much heated discussion has also taken place on the same subject, occasioned chiefly by the general acceptance of the Air Force as our first line of defence. There are still some who are unconvinced and we fear that in view of all the facts it is a case of:

"A man convinced against his will,
Is of the same opinion still."

The surrounding influences of many of the critics of air power are such as to bring bias in their writings and discussions. Undue stress has been laid upon the bombing of "people" and "open towns" and the real aim of strategic bombing carefully glossed over. This is "naïve mischief." The more dangerous writings seem to aim at undermining the mutual understanding, co-operation and comradeship between our three Fighting Forces. This is harmful to good team work and if continued liable to undermine our "fighting power," which is dependent upon the combined operation of our national military potential.

Could we but forget for the moment the principles of land and sea warfare, the study of which over centuries might carry with it certain bias, set aside pride in our own particular Service, be it land, sea or air, discard professional vested interests, and overcome our natural mental resistance to change or adaptation, then we might free our minds to see more clearly the reasons why "air power" should receive first consideration when planning the defence of even a maritime nation such as ours.

The line followed in the development of all our Defence Forces, the plans made for their future use and the training undertaken must be governed by the guiding principle of the extent and nature of their employment in any foreseeable war.

The only war visualized at present is that which would be occasioned by an attack by Russia on this country, which undoubtedly would take place simultaneously with an attack on one or more of our Western allies. This is a conclusion that is accepted by the majority and of which our Chiefs of Staff are well aware. The most likely form in which such an attack would be made determines the extent to which each of our Fighting Services would become involved.

Russia, knowing the disadvantages to her of a protracted war and that she would have a numerically superior Air Force at the beginning of hostilities, would no doubt try to liquidate British opposition before reinforcements could arrive in adequate numbers to turn the scale.

To achieve this, immediate command of the air over this country would be essential. Without this she could not hope to achieve a successful airborne invasion, and however powerful her armies, with recent developments in air power, they might be seriously handicapped in their operations.

That her armies would attempt to move swiftly to the Low Countries and the Pas de Calais is likely, as this would deprive the Western Powers of their

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forward aerodromes and greatly facilitate the air bombardment of England with flying bombs and rockets. We believe that, in conjunction with other kinds of air bombardment, she would not hesitate to use the atomic bomb, in a carefully worked-out plan calculated to destroy at the very outset our war potential, and bring about the collapse of our civil administration.

It will be appreciated, therefore, that **our first immediate danger would be from a devastating air attack on this country.** The success of this as a "knock-out blow" would depend upon surprise and the swiftness with which it was delivered, and therefore any formal declaration of war is unlikely.

Upon the result of this first battle and the strength and weight of the air bombardment immediately following it would depend our ability of continued resistance not only in the air but upon land and sea.

The destructive power now in the hands of air forces is so great that to lose command of the air over these islands of ours, for even a short period, might conceivably result in our being overwhelmed and conquered. Only those ignorant of the capabilities of air power would deny that the loss of command of the air by the destruction of our Air Force would mean also the wholesale destruction of our country and people by uninterrupted air bombardment and starvation by the cutting of our life-line for supplies across the seas. Either or both are too horrible to contemplate and the period before human endurance cracked under the strain would be brief.

While we have command of the air our Navy and Army can still keep our island home secure from any surface invasion; furthermore, the only serious threat to our being starved by the cutting off of our vital supplies from overseas would be the enemy's submarines. Without interference from the air the seeking out of these and their destruction would not be long delayed.

The first air battle would be stupendous and for us it would be a fight for time —enough time for our numerically inferior Air Force to be reinforced adequately by our American allies.

The threat of the vast Russian armies would not constitute the same immediate menace to our swift destruction as would her overwhelming onslaught by air bombardment.

The threat to us of an early defeat by interference with our vital life line of supplies across the sea would not be so imminent as that which would face us if we lost command of the air at the very outset of hostilities; if this happened the aggressor would be in a position to maintain continuous devastating attacks on our navies and armies as well as on this country.

It is an alarming thought that, at a time when our statesmen frankly admit the continued existence of this danger of war, our monetary position should necessitate reduction in the funds available for our defence. We only hope that such economies are only made where extravagances and wastefulness exist, as exist they do without doubt.

How, then, are we to put ourselves in a state of immediate readiness to deal with that which threatens us? It is to meet this danger that the plans for the future development, training and strategy of our Air Force must be based. Any such plans must include the demands that would be made upon air power for the support of the Allied armies in Europe, by tactical bombing, in resisting the advance of Russian armies.

The situation demands, in view of our inferiority in numbers, that we should have better fighter aircraft than the potential aggressor and pilots of superior skill to enable us to win this first battle of the air. Victory is not won by numerical strength alone, as was clearly established in the Battle of Britain.

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To reduce as quickly as possible the weight and strength of the air bombardment of this country which would immediately follow the first phase of the "onslaught," we must have the best bombers and highly trained aircrews, in numbers adequate for the job. Admittedly support would arrive from our American ally, but at the outset there are likely to be heavy demands on Bomber Command not only in strategic bombing but in support of the Allied armies facing greatly superior numbers.

The first call on bombers must be to play their part in the battle to win air superiority over the United Kingdom and Western Europe. This takes precedence over all other requirements.

The earlier we could bomb and destroy aerodromes, oil plants and storages essential to continued air action against us; vital bridges and other communications necessary for the movement of vast land armies; military headquarters and large military concentrations; the more casualties we should save and the sooner we should be in a position to transform defensive measures into active attack.

Our air power also depends upon efficient ground organizations. Firstly, there is the need for a highly efficient Intelligence Service to prevent our being taken by surprise and so minimize the effect of the first onslaught. We are still dependent upon our Observer Corps manned to establishment with *trained* personnel. The efficient operation of our fighter defence is dependent upon an adequate number of fighter control units fully manned by *trained* personnel. That every Air Force unit must be complete to establishment with a trained man in every position is obvious.

Efficient air defence not only concerns our Air Force but the whole civilian community supporting it, as it would soon become ineffective if the men behind it failed to "pass the ammunition." Our aerodromes and factories must be given security against sabotage.

Our Civil Defence must, without delay, plan the protection of the people against every form of air bombardment. Had the Japanese taken adequate air-raid precautions their casualties from the atomic bomb would have been reduced by nine-tenths. All these organizations are as much the first line of defence of this country as the aircrews who fight in the skies above them.

In the foregoing we have endeavoured to point out the need for an organized air defence of this country capable of defeating any attempt to knock us out in the first battle; if we lose the first battle this time there will be no last battle to win. The winning of this first battle will not give us victory, but avoid early defeat; any such war would still have to be fought to a successful conclusion. Neither air power, sea power nor land power alone can achieve this. The correct balancing of each portion of the nation's fighting power according to our needs is essential to our preparations for war, and the allocation of funds for each being dependent upon the part it will play.

In so short a space we have not attempted to enter into details, but by stating a few simple and what might appear to be obvious facts to show why first things must come first in preparing against possible aggression and why our Fighter and Bomber Commands, supported by their ground organizations, are undoubtedly our first line of defence. In the face of such arguments it would be foolish to embark upon any new schemes of specialized air support for surface forces which would weaken our ability to win the first battle. Once the first fierce onslaught is over, and the attack has failed, it would then be necessary to build up forces essential to ultimate victory. Only when an aggressor has been thrown on the defensive in the air can we hope to take successful offensive action on sea and land with full air support.

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[Air Ministry Photograph

Air Marshal Sir Hugh W. L. Saunders, K.B.E., C.B., M.C., D.F.C., M.M., Inspector-General of the Royal Air Force

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BIOGRAPHY: AIR MARSHAL SIR HUGH W. L. SAUNDERS

By A. H. Narracott

ON the broad shoulders of the R.A.F.'s new Inspector-General, Air Marshal Sir Hugh W. L. Saunders, has fallen for the past two years the main burden of the uphill task of rebuilding the Royal Air Force from the remnant left over after the huge run-down following the war. As Member of the Air Council for Personnel from September, 1947, until three months ago, he had to superintend the building up of virtually a new Air Force for the third time in its relatively brief history, and to do so under conditions of unparalleled difficulty, at the dawn of the Jet Age and in the knowledge that the R.A.F. had the heavy responsibility of being the country's first line of defence. In his new post of Inspector-General, Air Marshal Saunders will be able to see for himself the fruits of his labours, and he has the comforting knowledge that, although a very great deal remains for his successor to do, the R.A.F. is turning the corner slowly, though it may be some time before the patient is really fit.

The main problems facing A.M.P. in the past two years have been the continuing run-down and of restoring balance to a force which, suddenly depleted in numbers and losing a high proportion of fully trained personnel, inevitably became seriously unbalanced. When the war ended the Air Force numbered about 1,100,000 men and women. Today its strength is under a quarter of a million. In the intervening period successive generations of National Service men have also been taken into the Service and released again, so that the turn-over has probably aggregated more than a million. No organization could possibly take such a reshuffle in its stride; indeed, as Lord Tedder has said, no business undertaking could have carried on in such conditions. When their group was reached people were released without regard to the needs of the Service or to the adequacy of the numbers remaining in their particular trade. As a result, the R.A.F. could be maintained only by "plugging holes," and this involved excessive posting and much misemployment. This, in turn, led to no little complaint and dissatisfaction, which it has taken many weary months of hard work to overcome.

The last traces of unbalance in the R.A.F. will continue until the vacancies in the least attractive trades and occupations can be filled and the deficiencies in the junior non-commissioned officer ranks can be made good. There is no short cut to this end, but gradually re-engagement and new recruiting, backed up by National Service entries, are filling the gaps. Men of officer standard have not come forward in the numbers which the Air Council would like to see, but in recent months there have been signs of some improvement. The intake to Cranwell was filled for the first time after too long a period; schools which hitherto seemed to ignore the R.A.F. are providing cadets of the right calibre; men serving their eighteen months in the Air Force are, in most cases, learning a

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[*Air Ministry Photograph*

Second from the left is Air Marshal Sir Hugh W. L. Saunders, K.B.E., C.B., M.C., D.F.C., M.M., at a meeting of the Air Council, when Air Member for Personnel prior to his appointment as Inspector-General of the Royal Air Force. Seated on his left will be seen the late Chief of the Air Staff, the Lord Tedder, and next to him the Right Honourable Arthur Henderson, K.C., M.P., Secretary of State for Air. On the extreme left of the picture is Air Marshal Sir R. Victor Goddard, K.C.B., C.B.E., Air Member for Technical Services

trade or continuing with their old one; and recruiting for the W.R.A.F. has shown an upward trend.

In fighting this battle to see that the R.A.F. has adequate people for all its manifold activities, A.M.P. and others concerned with manning problems have been faced by two major difficulties. It is not yet certain what the permanent strength of the R.A.F. is to be, and so planning has had to be carried on in the dark, as it were. Prospects, pay and conditions inside the Service are not attracting sufficient men and women in these days of comparatively full employment in civil life, so that recruiting has been difficult in the extreme. This applies equally to permanent and short-service engagements. Economies enforced by the country's financial difficulties have made it difficult for the Air Ministry to make improvements which are admittedly desirable in more than one direction. In his position as A.M.P., Sir Hugh Saunders's aim has been to improve the prospects of reinstatement in civil life for those giving up Air Force careers, and the steps taken to further this aim should begin to bear fruit soon. As is well known, the C.A.S.'s Conference "Ariel," held last May, was designed to "harmonize the R.A.F. requirements for high-quality intelligence and technical skill with similar requirements in civil life." In other words, its object was so to dovetail civil and military employments as to make them continuous parts of the recipient's general education and development and not, as they have been in the past, phases which interrupt each other. Representatives from all walks of civil life entered into the spirit of the discussions and much good will undoubtedly result. The mass of suggestions—good, mediocre and unpromising—which emerged from "Ariel" are being sifted and prepared for translation into action, and the R.A.F. and its members will benefit mutually.

In handing over to a new A.M.P., therefore, Air Marshal Saunders can look back on a two years' battle against heavy odds, faced with the courage which has distinguished his career since his earliest days as a fighter pilot.

Hugh William Lumsden Saunders was born at Johannesburg on 24th August, 1894, educated at the Marist Brothers' College, Johannesburg, and afterwards embarked on a gold-mining career. Then came the First World War, and in its first month Saunders enlisted as a private in the 10th Infantry Witwatersrand Rifles. After his arrival in German South-West Africa his mining experience led

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to a transfer to the South African Engineer Corps as a sapper. In 1916 he moved again, this time to the 8th South African Horse, with which he won the Military Medal in East Africa before being discharged when the South African Horse was disbanded in February, 1917. However, his mind was set on flying and he obtained a commission in the Royal Flying Corps. After training at Winchester and Northolt he went to France in the following November to fly S.E.5's, and during the next nine months distinguished himself as a fighter pilot, winning the Military Cross and the Distinguished Flying Cross. The latter decoration was for attacking single-handed and routing a formation of seven German scout aircraft, the leader of which was shot down.

Having received a permanent commission in the R.A.F. in August, 1919, in the following March, Flying Officer Saunders was posted to No. 70 Squadron in the Middle East. Soon afterwards he rejoined his old squadron—No. 84—in Mesopotamia and took part in various operations. For low-flying supply dropping to a British garrison, during which his aircraft was hit by hostile fire from the ground several times, he won a bar to his D.F.C. Promoted flight lieutenant, Saunders returned to the United Kingdom at the end of 1923. There followed a short period at a group headquarters before he was posted to the Air Ministry for staff duties in the Directorate of Training, where he served until leaving in 1928 to take a course at the R.A.F. Staff College. Next followed two years on Air Staff duties at Headquarters, Air Defence of Great Britain (forerunner of Fighter Command), and from 1932 to 1935 Squadron Leader Saunders was overseas again, commanding No. 45 (Bomber) Squadron. In 1935 he started a second "tour" in the Directorate of Training and a year later was promoted to wing commander.

In 1938 he attended the Imperial Defence College and early in 1939 was seconded to New Zealand, where, with the acting rank of group captain, he served as C.A.S. of the R.N.Z.A.F., being confirmed in the new rank on 1st April, 1939. Home again in 1942, now an air commodore, Saunders was posted to Fighter Command Headquarters, first as A.O.A. at Bentley Priory with acting rank of air vice-marshal, and then as A.O.C. No. 11 Group. For two years he led this famous Battle of Britain group, whose squadrons had by now gone over to the offensive. Units under his command provided fighter cover for some of the earliest American bomber attacks from British bases, and Air Vice-Marshal Saunders was awarded the U.S. Legion of Merit. He directed and controlled the fighter cover over the Normandy beaches throughout the landing operation.

At the end of 1944 he returned to the Air Ministry, where, as Director-General of Postings, he obtained valuable experience for his subsequent post as A.M.P. The "centre" of the war had now swung to the Far East, and Acting Air Marshal Saunders was given command of the R.A.F. in Burma in August, 1945. After the Japanese had surrendered he returned to the United Kingdom to become A.O.C.-in-C., Bomber Command, in January, 1947. In the autumn of that year Sir John Slessor (who has just taken over as C.A.S. in succession to Lord Tedder) was appointed Commandant of the Imperial Defence College, and Sir Hugh Saunders was appointed to fill the vacancy thus created in the post of A.M.P.

In 1941 he was awarded a C.B.E., in 1943 made a C.B., and in 1945 advanced to K.B.E. In that year the Order of Polonia Restituta was also conferred on him by the President of the Polish Republic in recognition of his command of Polish squadrons during the war.

In 1923 he married Phyllis Margaret, daughter of Major P. W. Mabbett, and they have two sons, one of whom is commissioned in the Royal Artillery and the other is a flight cadet at Cranwell.

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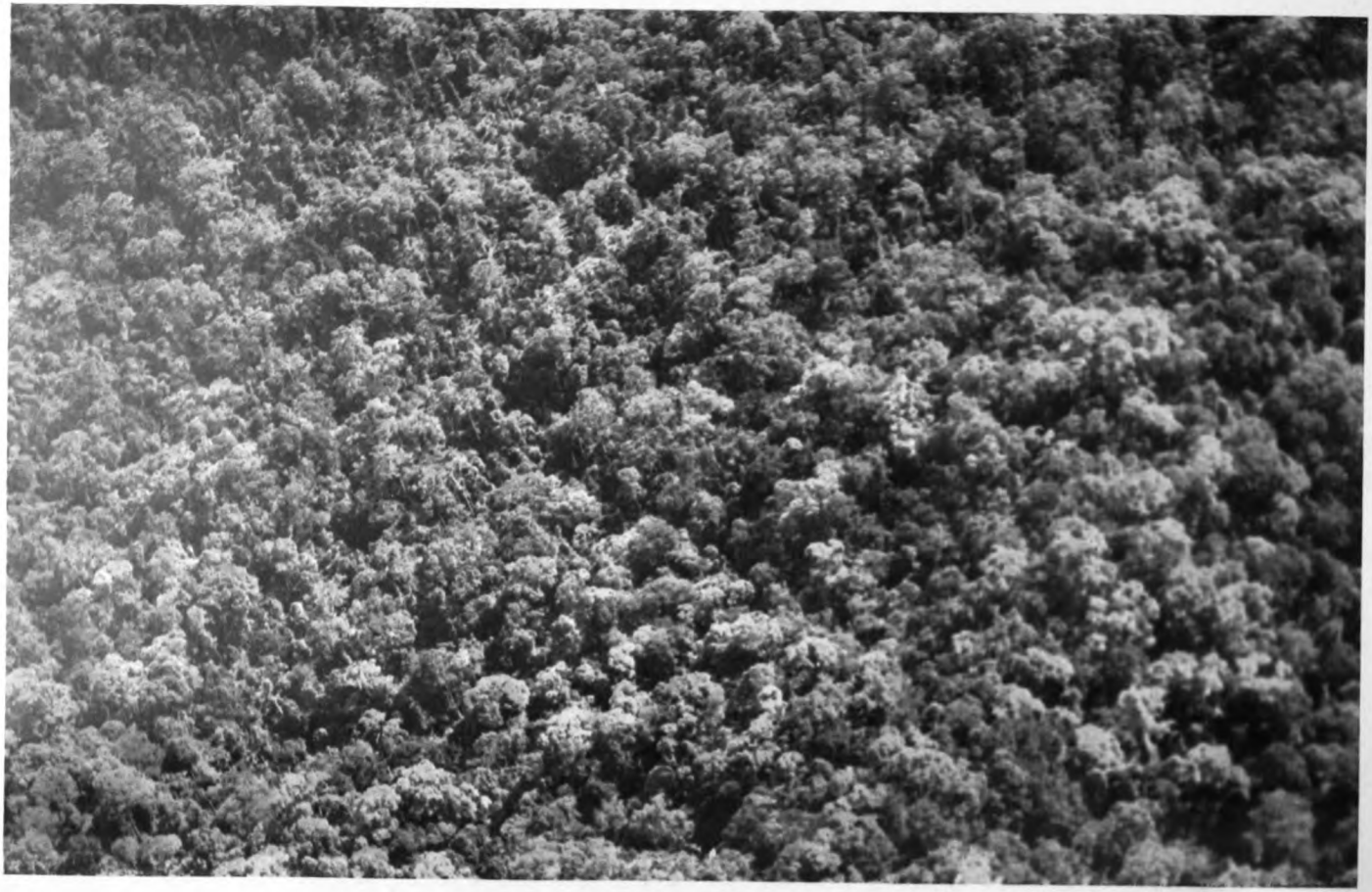

Typical Malayan jungle

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WHAT PRICE MALAYA?

By Group Captain J. Whitehead

MR. KNICKERBOCKER, in one of his last statements before he was so tragically killed, reviewed Communist activities in China and South-East Asia. Of Malaya he said: "A handful of jungle Communists were losing, but only losing to the best troops in the British Army." He went on: "The British had resisted Communism in Malaya with such effect that not only had it disappeared as an organized force in Singapore but common crime has decreased to such an extent that Singapore is the most orderly city in the Orient today."

Now this statement is certainly true in respect of Singapore, and because it is so true it should be very widely publicized and understood. Singapore is, in fact, the only remaining stable community in South-East Asia. In its very stability lies the measure of British prestige and influence in the Far East.

But, regrettably, Mr. Knickerbocker's statement as regards Malaya is manifestly less true, and to that extent it is a statement which may well encourage an all-too-ready complacency about the progress of the war in that country.

It is more than a year since the war of Communist insurrection in Malaya began and we are still a long way off winning. We are, in fact, so far off winning that unless more positive progress can be made soon we may well find that there is no successful end to it.

We have reached, after this first year, a situation of stalemate. True, it is unquestionable that, especially during the past six months, the efficiency of our police, army and air forces has greatly increased with training and experience. True, the wider deployment, deeper penetration and the very much higher standard of discipline, tactics and courage of the security forces over the enemy have clearly resulted in suppressing an increase in lawlessness. But the condition of stalemate is there because we have so far failed to get to grips with the enemy; we have so far failed to inflict on him a major defeat; we have, in fact, failed to destroy his ability to continue tactics of guerrilla warfare and armed banditry.

Relatively, of course, an average of fifteen murders a week by the insurgents does not constitute a major crisis or a major war. But prolonged insurrection even on this scale has wide and expensive repercussions. Indeed it may still develop into a major crisis. That is, of course, what we are out to stop. We shall not stop it as long as we kill off the enemy at the present rate of only two or three a day.

What are we up against? What are the reasons for the stalemate? Why is progress so slow? What, above all things, is to be done?

Mr. Knickerbocker talked of a "handful of jungle Communists." He was in that sense quite correct to do so. There are perhaps 3,000 (it may be more or less) armed insurgents in Malaya. Not very many when one considers that they are disposed throughout the length and breadth of the country. They operate for all practical—that is, militant—purposes in small gangs up to about ten men. Necessarily these gangs are concentrated round and about the areas where their attacks can be more effective.

Now 3,000 men (and women) can be regarded as a comparatively small threat to security in a country as big as Malaya when we have police, army and air forces at hand in total strength and efficiency far exceeding the strength and

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efficiency of the enemy. One might expect it to be a relatively simple matter either to provide static protection to the law-abiding communities or to limit down and kill, capture or drive out a guerrilla force of this size. Why is progress so slow?

The photograph with this article, taken from the air, shows a typical Malaya jungle. It is the most dense in the world. As a theatre of war it gives the enemy every possible advantage. Seventy-two per cent. of Malaya is virgin jungle. Another eleven per cent. is tree or mangrove swamp. Of the total area of 52,500 square miles only fifteen per cent. is under cultivation. Nor is it merely a matter of jungle. There are large mountainous areas with the tops—still jungle-covered—rising to over 7,000 feet. The jungle borders or surrounds all towns, villages, plantations and mining areas.

The planters and miners and their workers are small, isolated communities. The railways and the roads, all are through or adjacent to the jungle. Malaya is a thug's paradise.

The thugs, the insurgents, in Malaya are nearly all Chinese. They are the tools being used to create a Communist state. Their methods of waging war are not very advanced—simple tactics of murder and terrorism. And, like murderers, these insurgents are eager not to be caught. But insurgents, also like murderers, and indeed anyone, have to eat, be clothed; and they need money. All these are obtained by extortion.

It is in these tactics, and especially in this matter of extortion, that we find—complementary with the characteristics of the battlefield—our greatest difficulty. The Asiatic inhabitants of Malaya are submissive to the demands of the insurgents. They are submissive because they value their skins and their heads far more than they value allegiance to law and order. In short, if they are uncooperative in supplying not only food, clothes and money but also information about the security forces, the insurgents merely take what they want and are, to say the least, careless with their weapons in doing so.

The problem to the security forces is made worse by the illegal presence in Malaya of about half a million Chinese squatters. This element has established its own communities in clearings in the jungle, and is, without doubt, a main source of valuable assistance to the insurgents not only in the provision of supplies and information but as a source of recruitment to the Malaya Communist Party.

Broadly, therefore, we have a situation where the topography of the country is ideal for guerrilla activities and, conversely, extremely difficult for the security forces to come to grips with the enemy, and where the Asiatic population of the country is exclusively conscious of its own physical safety, and is in consequence only too ready to respond to threats and terrorism.

Our methods of fighting this war in Malaya have been developed over the past year into fully co-operative action by the police, army and air forces. This co-operative action takes the form of static protective posts dispersed and located to form a network of bases, and a system of patrolling and penetration into the areas known or suspected to contain the insurgents. The Royal Air Force provides the heavy power for application to any target of worth-while proportions found from the results of the police and military activities.

These methods have become effective to the extent of harrying and worrying the enemy into constant movement. In consequence he is finding it increasingly difficult to co-ordinate his activities, to obtain his supplies and to rest and train. But these methods are not in themselves adequate to bring the war to an end, for the reasons which have already been given.

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And so we come to remedies—for remedy the situation we must. It is clearly out of the question for us to intensify our military and air operations into a full-scale war. It is equally out of the question to effect the removal by force from Malaya of all squatter and co-operative elements. Both present problems of such magnitude in political, material and physical implications that to attempt them in the present circumstances of the post-war world is quite impracticable.

We are therefore left with finding a solution to the attitude of the Asiatic inhabitants of Malaya. We can do little about the terrain—the jungle is inescapable; all we can, and must, do there is to improve and develop our police, military and air force tactics to a still greater degree of effectiveness.

There seem to be two approaches to the question of obtaining the co-operation of the people of Malaya on the side of law and order. Words and promises alone will not be enough. No amount of academic instructions and counter-Communist propaganda will achieve quick results. Material and physical issues alone are of any potency. We can therefore either impose threats and penalties of a severity at least equivalent to those of the enemy, or we can make rewards for co-operation of such substance as to outweigh the physical fear and insecurity under which the people live.

We should be wise to do both. We should apply severe penalties to any individual or community which is known to co-operate with the enemy both in material supply and in the supply of information about the security forces. And we should liberally reward and put out of reach of the enemy any individual or community who co-operates with us in giving tangible information about the enemy to the security forces.

There is little time. If the stability of Singapore is not rapidly extended to the whole of Malaya the days of our prestige and influence in South-East Asia will be numbered. Mao Tse Tung is rapidly bringing the borders of Communist China down to Burma, Thailand and French Indo-China. If we fail in Singapore and Malaya the whole of the Orient will become a Communist sphere.

THE COVER PICTURE: "LIVING DANGEROUSLY"

"In the past our military leaders have been trained from an early age to develop a robust mentality. They have been encouraged to 'live dangerously' both on and off duty. The object was to teach them to grasp rapidly the essentials of a problem and thus make quick decisions. Imperial policing and the more dangerous sports assist in this. How should this training be obtained under present-day conditions?"

Entrants for the 1949 Bertrand Stewart Prize Essay were asked the above question by the War Office.

Our cover picture and the article on the R.A.F. Mountaineering Association show one of many ways in which the Royal Air Force is developing robust mentality.

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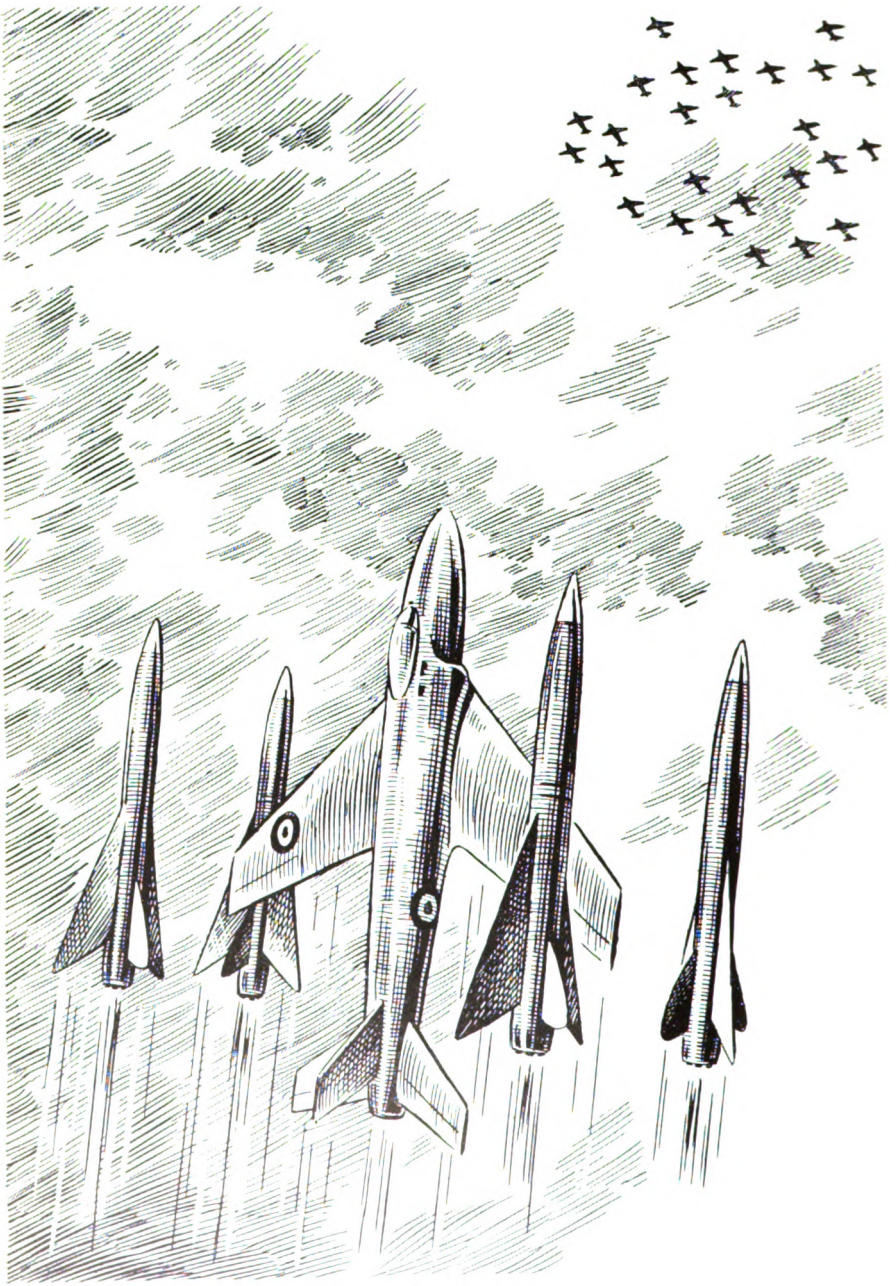

Destroyer aircraft with satellite rockets

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THE DESTROYER AIRCRAFT WITH SATELLITE ROCKETS

By Group Captain Nigel Walker

I

THE very name "fighter aircraft" has something indefinite in it. It sounds as though it is prepared to take punishment as well as to give it. In the sudden beginning of an air war, when every moment and attack is precious and vital, there should not be any thought of the possibility that an attack will fail to annihilate its target. Therefore, the name "fighter" for a type of home-defence aircraft against enemy formations should be changed to "destroyer," or some other equally expressive word, and its purpose just as definitely one of deadly attack with the certainty of making a kill—or more than one kill, many kills.

The figures for losses in the Bomber Command attacks during the last war were in the region of 5 per cent. on bad days; the highest for a large-scale attack rose to about 20 per cent. and that gave cause for intense searching into the reasons for vulnerability. When the campaigning starts again the losses of the enemy will have to be infinitely closer to 100 per cent. of the strength that sets out. The theoretical use of an atomic-bomb load being carried by one of the aircraft in such a stream makes annihilation a positive requirement and even the prevention of a really heavy bombing raid is something that merits deep thought. For, after all, if a defence is going to be mobilized it might very well aim at complete destruction rather than rely on inflicting only a "percentage" loss. An adequate "destroyer" with a real blast in its armament can do more damage when controlled by one excellent pilot than, say, two dozen mediocre pilots fighting on the hit-or-miss principle of human accuracy in weapon aiming and aircraft control.

It is extremely well known that interception of enemy formations is divided into two main problems once the formation has been tracked by some early warning device. Briefly, the first problem is to vector the defenders into attacking range which may be visual or determined by using airborne detectors. The speed of enemy attack leaves so little time for human calculations, or even for the translation of dial readings into instructions of distance and direction, that the efforts in the ground control room must be considered long enough delay when contact between defenders and attackers is anything but visual. The better performance of defence aircraft gives them the power to climb at a rate that brings their path nearer to the vertical, the difficulties of working out quickly a direct-approach vector grow, but, on the other hand, it allows them to gain height first before travelling on a horizontal vector provided for them at a level of their own choosing. Here lies an advantage of man-piloted against pilotless aircraft, since the former can gain height on a rough vector and then can set off on any interception course, but the latter can be set off only on a predetermined course for ground-level which for long-range interception may be miscalculated slightly but sufficiently for them to record a complete miss.

Equally briefly, the second problem is that of collecting sufficient weight of attack into one formation and of using that weight without serious loss to itself. It involves making up the formations around the airfield and in manœuvring

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them into weapon range of the enemy without becoming involved with their fighter protection or with the defence fire from the bombers. The enemy fighters normally station themselves with the surplus height that it has become customary to need before attacks can be contemplated; they are in a favourable position to meet the defenders as they approach and climb above the bombers. During an attack, swapping missiles with the bombers is only necessary when the range and calibre of both sides are the same. If the defending interceptors use larger calibre, longer-range weapons, they themselves are not exposed to attack, and if they approach from any direction other than from above they are reasonably well protected from the fighter screen.

For certainty of striking home, guided or homing high-speed missiles which can be launched from a range that is short enough to eliminate the possibility of them passing outside the influence of the attacked body, provide the necessary accuracy and fleetness of attack.

The problem then develops into mustering sufficient weight of attack capable of destroying whole formations.

The performance of any aircraft deteriorates as its load is increased and that of a formation likewise gets worse as its numbers within multiply. The solution seems to lie in the use of a single very high-performance aircraft, flown by an excellent pilot, taking its attack weapons externally and unattached.

Just as planets in the solar system keep the distance of their moons constant, so will a "destroyer" take its load of rockets for its attack when travelling from airfield to enemy formation. The direction-keeping will be the onus of the pilot and he would be under ground control until he is within the striking distance of his homing weapons. Then he will close to discharge the load and their acceleration will take them away on their mission; the total destruction in each batch of a hundred rockets would account for ninety enemy aircraft.

II

The conception of a new idea, especially in warfare, is not the time to discuss the technicalities of its future. It is the time to search around to discover if its future birth will be a benefit or if the child will be paralysed from uselessness.

The possibility of using piloted aircraft as the core for a number of self-propelled satellite weapons is one which raises expectation of success through the following assets:

(1) It has a terrific hitting power against a large aircraft formation.
(2) It is economical in aircraft and pilots.
(3) It can be used in all weathers.
(4) There is little congestion in the landing area.
(5) The advantages of pilot control are retained.
(6) The missiles are cheap compared with aircraft.

The principal foundation for proposing such a method of carriage is based on the fact that two opposing forces can reach a state of equilibrium. If the aircraft has a repelling force emanating artificially from it and the missile has an attraction towards it, a state of equilibrium will be achieved where the missile becomes stationary relative to the aircraft. Provided the two bodies are travelling at equal speeds, the system will act as though it was directly connected throughout and both the aircraft and the missile will travel on parallel courses. If several missiles are harnessed in this system they can be made to take up stations equidistant on the circumference of a circle around the piloted body by virtue of mutual repulsion of a weaker nature than is provided by the aircraft.

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The influence of some agency, such as sound, on a homing mechanism is well tried and therefore it must be possible to create another agency by artificial means within the aircraft to provide repulsion. With the first mechanism tending to bring the rocket towards the central aeroplane and the second agency, working on its different principle, tending to keep it away, an easy state of equilibrium will be possible, especially if there are air controls at both ends of the rocket. There will be a tendency for the rockets to circulate on the periphery of the circle which is the equilibrium distance from the aircraft, but with a full circumference of rockets the rotation will be slow and will only tend to increase slightly the circle radius. With circular bodies and symmetrical delta-wing fins there should not be any necessity to maintain a stability in the rolling plane of the rockets and any small corrections of direction being made by an inclination of the head. However, when the rockets are released from the aircraft they will soon become homing weapons after their acceleration and will be outside the remaining influence of the guiding aeroplane. The tactics of this aircraft will call for a steep dive once it is on its own.

A first-line fighter of today may have a wing span of 40 feet and a length of 30 feet; its load is somewhere in the region of 10 per cent. of its weight, which may be 13,000 lb. In order to arrange for twelve rockets to travel in company with this aircraft, there would be a need for the circumference of the circle on which the satellites settled to be only a foot or two beyond the wing-tips. This would allow weapons of five-foot diameter to have a clear five feet between each other on this periphery. A more feasible size for the constellation would be provided by increasing the clearance at the wing-tips from two feet to ten feet. This would make the over-all diameter of the system 65 feet; with the same five-foot missiles and five-foot spacing, the system would be loaded with forty rockets. With aircraft 30 feet long there is sufficient distance between nose and tail to secure longitudinal stability by actuating the missiles from both ends of the fuselage. For the equipment in the aeroplane to keep these missiles in harness an estimate in the region of one ton can be made and it can be increased if the fuel load is cut down.

The performance of this modern fighter encourages the belief that it can fly upwards in company with rockets. Its engined performance gives it a climb of some 7,000 feet per minute. The acceleration at take-off is bad, but it can be stepped up by subsidiary means which would probably be a combination of rocket assistance and catapult. For the climb to a ceiling of 45,000 feet the period of gaining height would be only six or seven minutes and this would be reduced to five or six minutes if the assisted propulsion effort is continued with an effort that gives a climb of 8,000 feet per minute. This climbing rate is within the speed range of rocket weapons, especially if they are provided with subsidiary aerofoils. If the full benefit of rocket propulsion is to be gained, then the performance of the aircraft will have to be stepped up and its type will have to be made a separate class from the fighter as it is now being built.

Flight in the proposed state of equilibrium may be possible now, but there will have to be development in launching the system because the take-off acceleration of an aeroplane is so far below that of a rocket. The process of runway travel and undercarriage retraction will have to be eliminated. Instead the whole system will be launched together by using a catapult with the aeroplane in the centre and the missiles disposed around it on a framework extending over the cradle. This will ensure that the system is in a fairly neat formation ready to take up climbing stations without delay. By elevating the track the initial discharge will approximate to the climbing angle in an effort to reduce the need for turning the

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system from one heading to another during flight. The whole thing may be reminiscent of a glorified flying-bomb launching base, but it will have the advantage of reducing the length of time between an order to take off and its execution. The taxi-ing time and one or two other necessary delays will be cut out.

A rocket travels in a straight line at a constant speed after the primary acceleration has finished and therefore the aircraft will have to do the same thing. From an interception problem this has at least one advantage. A steady rate of climb can be achieved by good piloting and this will enable accurate distance to be worked out at predetermined heights to show how far the aeroplane will be from the vertical above the launching point. From these positions it will be easier than it is now to give vectors and heights to the pilot before launching. It may be possible for the launching platform itself to be turned before take-off. With the steady climb and accurate timing of the launch there should be very little need for late course corrections as the aircraft gains height and approaches the level of the enemy formation. As the angle of climb gets more near the vertical there will be problems not only of intimating the need for a direction change but also of providing an instrument to read the azimuth bearing on to which the pilot will be facing when he levels out.

When a succession of these systems is launched from one aerodrome they will each climb on the same bearing until they are almost at their attacking height. Then each one will, in turn, get on to his course for the interception and in a fanwise spread will be vectored towards the line of approach of the bombers. This target will be big enough for airborne radar to give a direction and range indication during the last few miles of the approach, which will be made at a high closing speed. The course of the fighter will not be reciprocal to that of the formation but will be inclined at about 45 degrees to it, as this will allow the homing missiles the best chance of striking home first time. It will help the tendency these homing weapons have of curving on to a stern chase, but this would be preferable to the extremely high relative speed if the launch took place from ahead, in which case a pass would mean a complete miss. The mutual repulsion of the missiles will ensure that they do not all seek the same target after they are released from the system.

With a launching interval of ten seconds and therefore a climbing interval of 1,000 feet followed by a level flight interval of one and a half miles, the intensity of attack from one aerodrome is six systems per ten miles' advance of the enemy formation. Thus in the hundred-mile advance towards the coast after the first attack there is a chance of shooting down 700 aircraft before the coast is reached. This is calculating on twelve rockets per system. The figure for destruction using the forty-rocket system is 2,400 enemy aircraft in the same distance. The direction of attack may nullify the slight chance of any fighter defence that has been brought by the bomber formation and the surprise of these tactics at the beginning of a war would have a tremendous moral effect because such an attack would be over in about a minute and a half without giving the bombers much chance of retaliation.

A means of attack such as this offers many advantages over some of the others. The mass launching of guided weapons of very high speed has the disadvantage of inaccuracy owing to the problems of aiming from the ground. The provision of an impassable area by the use of an atomic explosion is very expensive and difficult to repeat in case of a continuous attack. The use of fighters by themselves has proved that a small proportion of the bombers can be accounted for and

(Continued on p. 29

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THE FUNCTIONS OF AIR POWER

By Lieutenant-Commander G. W. R. Niholl, R.N.

I HOPE that many of my brother-officers in the Navy found as much food for thought as I did in the first issue of the new series of this journal. There were two important articles which, in particular, held my attention. They dealt with the various ways in which the air weapon has been and can be employed. May I, as a naval aviator, try to put forward some quite personal opinions on that subject from another's viewpoint?

First, it would be wise to follow Squadron Leader Peacock's excellent advice and make quite sure of the meaning of the terms to be used. There can be no quarrel with his definition, in "The Influence of Air Forces on Sea Power," of the term "sea power" in the words of Mahan and Corbett. But in arguing the means by which it can be exercised, the perpetuation of a fundamental misconception common to most debaters of this subject must be avoided. Air power and sea power, in the maritime sphere, are not two different and contending things. The first, it is submitted, is merely a weapon by which the second can be achieved. Control of the air above the sea has eventually become recognized as being an essential prerequisite to successful surface action. But what is also important, if the exercise of sea power is to be fully efficient, is the way in which the air weapon is wielded and, in the final analysis, the qualifications and training of the men who actually do the wielding. The same is true of the military aspect. Because much woolly thinking out aloud can still be heard on this subject in Service messes it may perhaps help if we go back a bit in recent history for the possible causes.

Before the development of the aircraft, the boundaries of the two more tangible elements were quite clear-cut, militarily as well as physically. When the interests and activities of the two Services tended to converge or overlap it was simple to arrive at a sensible and amicable agreement; broadly, the Army protected the Navy's bases, while the Navy assumed responsibility for the safe passage of troops and arms across the oceans. But with the coming of the war plane the ubiquitous nature of its natural habitat appeared to throw military thought into confusion.

At first there were those (as always) who contended that the claims of the new protagonists were as tenuous as the air in which they placed their faith, as Air Marshal Sir Robert Saundby has shown in "The Development of Bombing." As far as our Services are concerned, the official record of the early controversies is not easy to come by, but, with the greatest deference to Sir Robert Saundby, was Lord Trenchard's struggle to establish a separate Air Force of the magnitude implied? Arrayed against him were the powerful and more senior heads of the established Services who, if they had had anything more than the weakest faith in the air weapon and, it follows, anything more than the weakest arguments for its retention in existing form, must surely have prevailed; the reasoning being that the faith and vision of Lord Trenchard gave him a virtual walk-over. In other words, will not future historians read it rather as short-sightedness, resulting in the Navy and Army disowning and casting off an arm that not so very much later was to cost them dear?

Co-operation between the Services, on the scale that was soon to be needed, was negligible; and each talked a different language. Indeed, these things were no cause for great surprise at the time, being the logical consequence of assump-

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tions based on a false premise. Past experience had shown that the military and naval forces could very largely conduct their own private wars with minimum co-operation and consultation. True, there was now a third force, but presumably it could be left to deal with its own responsibilities in a similar manner. So appeared to think those who had misread or ignored the writing on the wall. Preparations for the next war were seemingly being made in anticipation of a start at the point at which the last one ended.

Meanwhile the new third force went vigorously ahead along the lines it so fervently believed in. If progress in the development of the new power was remarkable, it was all the more understandable if enthusiasm was sometimes too far ahead of the evidence of the aircraft's current abilities. Nothing is so satisfying as increasing conviction that you are right. Progress was indeed so rapid that the faith of the sceptical who had elected to take independent courses began to be shaken. It was not long before a gesture was made to a less confidently viewed future—the first few flights of the Fleet Air Arm and the Army co-operation squadrons came into being.

But the major error here was that neither the Navy nor the Army had senior officers with the necessary knowledge or experience for using this weapon. Nor were any transferred to the Navy when complete responsibility was later assumed by the Admiralty for naval aviation. At the same time, the R.A.F., chiefly concentrated as it naturally was on evolving new conceptions of strategy and tactics, had lost touch with developments in the purely naval and military spheres. The two new sub-arms therefore got off to a bad start, whole-heartedly and intelligently nurtured by none.

If a change of view now appears to take place, it is done in no partisan spirit. Modern war is not divisible; we are but the combative branches of a larger fighting organization, and endeavour is being made to view the subject objectively, if critically, from that standpoint. It should therefore not come amiss at this point to return to earlier advice and make clear what are considered to be the basic functions of the three arms. Successful sea or air battles do not win wars, only the land arm can do that by virtue of its ability to consolidate victory, which, in practice, is the role of the infantryman. And it is presumably accepted that he is functionally no less an infantryman for being dropped on his objective from the skies or ferried to it across the sea in boats. That admitted, it is not an over-simplification to state then that the clear duty of the other arms should be so to conduct their actions that they are inevitably and inexorably directed towards enabling him to achieve his objective, the "grand" objective. Pet schemes and other issues which do not have this in mind can have no place in sound planning.

(Photo: Imperial War Museum

Co-operation of sea-air power makes possible the ferrying of the army across the seas to land on the enemy's territory

The arts of land and sea (no less than air) warfare demand the study and training of years if they are to be mastered. Increasing complexities make this truer still today. The war proved the vital need for each to have

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Co-operation of the three fighting Services. As night approaches masses of glider-borne troops and parachute troops pass over the bombarding ships standing off the invasion coasts

the air weapon if they were to prosecute their respective parts successfully, indeed at all. As has been said, the air weapon is not something alien in these two spheres: it is now an integral part of the fighting machine of each. But if that weapon is wielded by a Service brought up literally and figuratively in another atmosphere, it must surely be acknowledged that the result will not be so efficient or effective.

That it *did* finally prove sufficiently effective to enable us to win the war is no argument that it cannot be improved upon. The examples of its inefficiency (inherent in such a system) in the early stages are many. The unfortunate misunderstanding with the Navy over the interpretation of the word "control" with regard to directing the fighter escorts for coastal convoys, which resulted in months of delay, is but one illustration of the language difficulty. The beginning of the North African campaign provides another, when, owing to misconceptions and ignorance of the scope of air tactics on the one hand and military requirements on the other, it became necessary for the R.A.F. staff to go and live in actual physical contact with their opposite numbers of the Eighth Army, the better to remove mutual misunderstandings. A routine tour of duty of two or three years in the Tactical Air Force or Coastal Command before being posted elsewhere does not give sufficient time to master the military or naval subject.

The use of air power in the military sphere is not now a side-issue with the Army; it is the spearhead of their attack and the buckler of their defence. The same applies to maritime warfare—in which connection it should be noted, of course, that carrier-based aircraft play only a specialized role in that aspect of air power. But for the R.A.F., it is contended, these are side-issues, subsidiary to their main role, and they cannot therefore give its problems that measure of concentration which is their due—or to attempt to do so can only be detrimental to that main role. While agreeing with many of Squadron Leader Peacock's able arguments, exception must be taken, for the reasons given, to his adjuration that "naval air" should not be regarded as something different from the other "air." It is different, as much as each in turn is different from "military air." To argue

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an unalterable fact can only lead to a dissipation of effort; to recognize it, on the contrary, must strengthen all arms which steadily hold in sight the grand objective.

If the Tactical Air Force should come entirely under the Army and Coastal Command under the Navy, it may well be asked by some: "Where, then, does the R.A.F., as such, come in?" The answer to that is, for the fulfilment of the two supreme roles; two roles that are accumulating ever-increasing importance because of the enigma that faces all peace-loving countries today. The responsibility, first, for prosecuting the medium- and long-range bombing policies; secondly, the fighter defence of the homeland and the bases from which the general fighting organization has to operate. If the second is effective against an aggressor, the only hope of ever regaining the initiative lies in the first having an efficiency of the highest order. These two problems are not, basically, naval or military ones.

It is sincerely hoped that it will not be imagined that the adjective "supreme" has been thrown in gratuitously as a sop. In this atomic and supersonic age the traditional opening gambits of past wars have surely gone for ever?—Hiroshima marking the passing of that era. No more will there be the formal declarations of war, the "phoney" periods, the feints and testing probes at distant perimeters, the long-drawn-out methods of attrition. The boomerang consequences of mistiming or misplacing the first paralysing, if not annihilating, blow are so dire that a potential aggressor must be prepared to gamble his all on it. With a weapon in his armoury that is capable, if used aright, of stilling the heart of his objective, he knows that the convulsive reflex action of the limbs must soon die away. To such depths has our civilization apparently fallen that treachery of the subtlest kind must be guarded against.

If we do not consider defence against this form of attack and *immediate* retaliatory measures as constituting the two supreme military problems of the times, then our days seem without doubt to be numbered. And, the time factor being what it is, only air power is seen as being capable of providing the answer. To think and act along more conventional lines will, it is earnestly believed, lead to the perpetuation of the old mistake: planning the next war from the point at which the last one ended.

This brief presentation of a personal view admittedly leaves many loose ends, both great and small, but they are either outside the scope and space available here or are matters to which no answer can yet be given.

AMENDMENT TO THE OCTOBER NUMBER OF "THE ROYAL AIR FORCE QUARTERLY"

"FLUTT'RING HIS PENNONS VAIN"

On page 135, between lines 17 and 18, the following was omitted in error:

"A division on a light scale requires, according to Army/Air Operations Pamphlet No. 4, Appendix 3, a total of 2,838 Dakota sorties, taking the effective preplanning payload of a Dakota as 5,500 lb. This figure includes a 6-pounder anti-tank battery, a light A.A. battery, a light artillery regiment and two field artillery regiments."

This paragraph should be inserted after ". . . at an average payload over that distance of some 8,000 lb."

[The error which occasioned this omission is regretted and sincere apologies are offered to our author and readers alike.—ED.]

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THE PART OF STRATEGIC BOMBING IN MODERN WAR

A COMMENTARY

By Air Marshal Sir Robert Saundby, K.B.E., C.B., M.C., D.F.C., A.F.C.

In his thoughtful article, under the above title, Wing Commander H. P. Whitworth, A.F.C., makes many good points, but my experiences in Bomber Command during the last war lead me to question some of his statements and the conclusions he draws therefrom.

I agree with what he says under the heading "Air Superiority." He notes that we did not begin the war with air superiority, but, after the defeat of the Luftwaffe in the Battle of Britain, we were able "very gradually to build up and then establish air superiority over the German air forces." But he does not indicate how this was done, and I shall have something to say about that later.

I also agree with his conclusion that the proportion of the national war effort devoted to strategic bombing, 7 per cent. over-all and 12 per cent. at its peak, shows "that we did not attempt to use the air as the real war winner, but rather that we relied on the combined efforts of all three Services to achieve victory."

He refers to our early attempts against the German warships in daylight and says that our losses "forced us to resort to night bombing and this change in policy seriously affected our bombing throughout the war." This is a little misleading. It is indeed true that the success of our fighters in 1940 forced the Germans to adopt night bombing and, because they were unprepared for it, this really did adversely affect their bombing for the rest of the war.

But we had always doubted the possibility of daylight bombing, and we therefore, before the war, backed it both ways. Our heavy bombers were suitable for use at night, and our crews were well trained in night operations. We had also realized that "visual bombing" would probably be impossible either by day or night, and so had put in hand the development of radar "blind-bombing" devices. But the requirements of our air defences naturally took priority, and we did not get our radar bombing devices going until the end of 1942. They were quite new, and we had to learn how to use them as we went along.

I agree that in 1941 we dispersed our effort. We were well aware of this in Bomber Command, but the demand for the attack of many different target systems was insistent, and could not be brought under control until we had practical proof of its ineffectiveness.

Wing Commander Whitworth says that the decision to concentrate heavy attacks on large industrial areas, "area targets" (as they were called by the Press, but not by Bomber Command), was based on the view "that German economy was stretched to its limits, and that any general chaos caused to German industry" would seriously reduce the German output of armaments. He says that, in fact, the output of German armaments rose steadily until the latter part of 1944. He concludes that "the devastation . . . of all the major German cities and industrial areas, on the false assessments of economic experts backed by military leaders, must be classed as one of the most serious blunders of the . . . war."

Here, I think, he has gone seriously wrong, although I agree that our economic intelligence was inadequate.

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What happened was this. In 1941 the Germans had only a small proportion of their industrial resources engaged in war production. They expected to win the war in 1940, and therefore thought it unnecessary to organize their economy for total war. By the beginning of 1941 they saw that the war was going on for a long time, and that they could not make an all-out effort against this country without first settling with Russia.

Their plan was to attack Russia in March, 1941, and they hoped to win that campaign before winter set in, or at latest before the winter of 1942. Then they intended largely to reduce their armies, and to build up a vast air and submarine force to defeat this country.

They began therefore to reorganize their national resources to support this plan. In addition, they now had at their disposal a large industrial potential in occupied Europe.

The problem was not to reduce German war production—that was impossible —but to hamper and slow down its reorganization and expansion, so that the armaments needed for the success of the German war plan would not be forthcoming.

In this the strategic bombing campaign succeeded. Of course, German war production, especially of vital weapons, increased as the war went on. But the point is that the increase they achieved fell hopelessly short of what was required. The Germans could make no headway with their plan, and were thrown on the defensive; first in the air, and then, as a consequence, on land and at sea. It was therefore in this way, by strategic bombing, that we gained air superiority, and I do not see how we could have gained it in any other way.

It is not true that "the morale of the homeless [German] workers remained extremely high under the worst possible conditions." In fact, their morale was extremely low, but they were rigidly controlled by the Gestapo and just had to struggle on and bear it.

Wing Commander Whitworth concludes that strategic bombing is not worth while unless a weak but vital point, suitable for air attack, can be found in the enemy's economic system. If this were true, strategic bombing would hardly ever be worth while, for I venture to prophesy that, if the enemy is a great power, such a weak and vital point will not be found. It was the dream of the experts in the Ministry of Economic Warfare, in the last war, to find such a target system. Many times they thought that they had found it, but they were always wrong.

It is true that after Germany had lost the Rumanian oilfields her large and unmistakable synthetic-oil plants became a good target system. When an enemy is nearing defeat, such vital weaknesses are liable to occur, and it is one of the objects of a strategic bombing campaign to create them. When they have been created they form, of course, very remunerative targets. But, generally speaking, a great industrial power must be extensively hammered before such weaknesses occur.

I do not decry in any way the importance of economic intelligence concerning a potential enemy. On the contrary, it is probably one of the most important factors in modern war. But we shall, I think, deceive ourselves if we expect to find a decisive weak point, for the hard truth is that a modern industrial country cannot be destroyed "by a bullet through the heart." Its vitality is far too great.

So much for the past. With regard to the future, the atomic bomb, with its terrific destructive effect, is certain to have a profound influence on the selection of target systems. But that, as Kipling says, is another story.

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THE DEVELOPMENT OF STRATEGIC MOBILITY IN THE ROYAL AIR FORCE

By Squadron Leader C. T. Nance

INTRODUCTION

IT has long been accepted that underlying the successful conduct of war have been certain fundamental principles. One of those most widely acknowledged is the importance of rapid movement, the power to attain which has been termed "mobility." "Rapidity," said Sun Tzu in 496 B.C., "is the essence of war"; and this basic precept has been recognized by successful commanders down the ages to the present day.

In relation to air forces, it is customary to classify mobility as either tactical or strategical. It is with the latter—the power of movement between operational theatres—that this article is concerned. It is a commonplace that air forces, in their development from the primitive to the complex, have been found to require an ever-increasing amount of ground equipment and airfield facilities, with the result that moves between theatres have tended to become increasingly difficult and slow. The restoration of strategic mobility appears to be one of the principal tasks now facing the R.A.F.

The lessons of history seem to endorse this requirement. Empires have been built on the power and speed of the foot soldier, the horseman, and the sailing ship, but, through failure to increase their speed of strategic movement in proportion to extending commitments, they disintegrated. The British Commonwealth, built up largely by the sailing ship, was consolidated by the steamship; but sea power alone is no longer sufficient. As Lord Trenchard has said, "All operations depend at present on air predominance; and therefore on air strategy depends all strategy." Air power becomes, then, the scion of this inheritance, and faces its historic challenge.

Let us therefore consider the requirement for strategic mobility in the R.A.F. in the light of our current obligations, assess the effect of the trend of technical advance on this requirement, discuss current progress towards its achievement, and suggest by what means it may best be attained.

REQUIREMENT FOR MOBILITY IN THE LIGHT OF CURRENT OBLIGATIONS

Current Obligations

Much has been written on the problems of Imperial Defence, and it would serve no useful purpose to recapitulate here: the concentration of most of the Commonwealth's industrial man power in the United Kingdom inevitably renders more difficult the defence of its widespread and extensive territories, and postulates that a considerable portion of the air commitment must fall upon the Royal Air Force. The R.A.F. must also shoulder much of the responsibility for the defence of Western Europe, and at the same time be prepared to render to the

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Army and the Royal Navy such support as they may require in fulfilment of their own strategic roles.

The meeting of these obligations is the more difficult in that modern weapons have greatly increased the value of surprise, while the custom of a formal declaration of war is no longer universally respected.

In phasing our plans, however, we must remember that, in terms of the power politics of today, Britain is relatively a small nation, and that there is a primary need to build up a firm economy without which any war effort must be but a travesty. The size of the R.A.F. is thus likely to be restricted for many years. **It is evident that only mobility of the highest possible order can enable so limited a force to honour commitments so wide in geographical coverage.**

Mobility by Long-range or by Strategic Movement?

There is, however, considerable contention how this mobility should be achieved. With the increased ranges now technically possible, the view that very long-range aircraft should be able to strike at any target direct from home bases, thus precluding the need for strategic mobility, finds many supporters.

But attractive as at first sight is the idea of dispensing with forward bases and their requirements for defence and supply, this viewpoint neglects the fact that, as range increases, the number of sorties must be reduced, and those navigational and bombing aids dependent upon transmissions from friendly territory become increasingly inaccurate. Furthermore, the advent of the jet and rocket fighters demands a performance from the bomber that can be attained at long range only at the expense of a penal reduction of bomb load.

In addition, forward bases are required for many tasks for which small, high-performance aircraft are needed, and to provide the intimate local knowledge necessary for Imperial policing.

But perhaps the most important circumstance militating against the use of long-range at the expense of strategic mobility is that the United Kingdom no longer provides an absolutely secure base, so that our striking force should be able to operate from elsewhere.

The R.A.F. should therefore strive not for a world-wide airborne range but for a world-wide strategic mobility: only this can enable the R.A.F. to cover its many and widespread commitments. "We must," as the C.A.S. has recently said, "break the chain tying us to concrete and this country."

EFFECT OF TECHNICAL ADVANCES

It would be unwise, however, to proceed to develop this requirement for strategic mobility without first analysing the effect upon it of the current trend of technical development. It is frequently suggested that atomic weapons and guided missiles have outmoded the principles of military strategy and will herald an era of long-range "push-button" warfare in which strategic mobility, *inter alia*, will no longer be necessary. Let us therefore briefly consider these developments and endeavour to assess their probable effect.

The Atomic Bomb

The atomic bomb is in essence but a very powerful explosive. Far from belying accepted principles, it represents their fulfilment to a remarkable extent: "concentration" in that the explosive power derived from many thousands of man-hours can be contained in one missile, and "economy" in that the explosive power generated per production man-hour is increased some six times; while its

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compact and readily portable nature allows considerable "flexibility" in its use, and permits the maximum advantage to be taken of "surprise."

But its very concentration militates against its widespread employment. Each bomb represents such a large proportion of the nation's productive effort that waste cannot be tolerated. Whether they are to be delivered by aircraft or by guided missiles, accurate navigation to, and identification of, the target will be essential; both are facilitated by proximity of the launching bases to the target.

Guided Missiles

The principal claim of the V1 and V2 types of weapon to revolutionize the principles of air warfare lay in a supposed ability to operate in the face of hostile air superiority. But this claim has been abrogated in the event: as Sir Roderic Hill has pointed out, "only air superiority could ensure that the places where the missiles were stored, serviced and fired, the crews who fired them, and the vehicles which carried them . . . would not be subject to systematic interference."

The recent successful test of a two-stage rocket indicates that long-range missiles are now a technical possibility; but the accuracy with which they can be directed and the ratio of explosive load to size diminish rapidly with increasing range.

The need for local air superiority and for operating from forward bases is, then, no less for guided missiles than for aircraft.

Though technical developments may mitigate the effects of guided missiles and the atomic bomb, it may well be that at present the only effective defence will be the early destruction of the enemy's vital resources and of vulnerable points in his supply organization, which can best be achieved from bases as near as possible to these objectives.

Both in defence against these weapons, then, and to derive full benefit from their increased striking power, the ability to operate from forward bases may be more important than ever before.

Nuclear Power

It is known that research is being done, principally in America, into the use of nuclear power for aircraft propulsion. Were this to be successful, the chief benefit would be an extension of range and endurance to the virtually unlimited. But it has already been pointed out that the capacity to achieve longer ranges does not of itself nullify the requirement for strategic mobility. Indeed the advent of atomic propulsion would assist its achievement by relieving the need for liquid fuels, now the largest item in the transportation bill.

It is, however, in the field of industry that nuclear power can be expected to make its earliest contribution, and its low cost of transportation per unit of energy produced can be expected materially to hasten development of the Dominions. Here, then, may well be the motive for a redistribution throughout the Commonwealth not only of industrial resources but of population, long advocated by writers on Imperial defence. But, though this can be expected considerably to reduce the vulnerability of the Commonwealth, it is likely to accentuate rather than to alleviate the need for mobility, since means will still be required to concentrate this deployed potential at the decisive place.

The Effect of these Advances

It is beyond the compass of this short article to speculate which of the above developments will become major considerations in future war. But it is evident

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that whatever effect they may have on the explosives with which air war will be waged or on the means by which these explosives will be conveyed, the requirement for bases near the operating area is unlikely to diminish.

The need for strategic mobility will thus remain, and may well become more pressing. We shall therefore be justified in taking far-reaching steps in its development.

CURRENT PROGRESS TOWARDS ATTAINMENT

It is not proposed here to consider in detail the requirements of the simple conception of the strategic mobility of air forces. These have been compared *ad nauseam* with those of a navy—main, subsidiary, and transit bases, and an organization permitting ready movement between them—and are universally accepted. Rather is it of value to survey briefly current progress and then to consider any departures from the traditional approach that appear to offer benefits.

The Air Ministry has recently given considerable thought to the problems of strategic mobility. It has been appreciated that mobility depends to a large degree on prearranged administrative plans, and, while the extent to which forces can be concentrated into a centrally held mobile reserve is ultimately limited by the minimum size of garrison forces required in each locality, it has been recognized that certain squadrons should be suitably equipped and held in readiness for a mobile role; that an adequate air transport force and a strategic route with suitable staging posts should be maintained; that frequent exercises should be held in all climates; and that continual staff study at all levels should be given to the detailed problems of initial movement, supply and reinforcement.

Such practical trials and studies as have been undertaken to date have resulted in the development of an accepted doctrine. It has been found that moves of squadrons by air can be economical and that maintenance by air of small forces is practical. Maintenance of large forces, including heavy aircraft, by air is, however, very costly and requires a high proportion of transport to combat aircraft. It is probable that the maximum acceptable proportion has been reached in the current establishment of the R.A.F., and while expansion of civil air lines would be of considerable assistance it is likely that financial considerations will preclude this for some time to come.

It is thus evident that the strategic mobility of our major air forces is unlikely to be facilitated by any appreciable increase in the amount of equipment that could be moved by air. It is therefore necessary to seek the required improvement by reducing the total quantity that must be moved—both by air and surface means—and the distance through which it must be transported.

The value of close co-operation between the scientist, the technician and the Fighting Services was one of the most important lessons of the recent war. Unfortunately, although this co-operation is leading to the development of lightweight air-transportable ground equipment and to a search to design aircraft of lower fuel consumption and greater ease of servicing, the dictates of performance are such that no considerable reduction in the weight of material required to support an air force can be expected until the advent of nuclear power plants; an influence unlikely to be effective for several decades.

There are, however, certain other fields in which technical development could make a further contribution, particularly in reducing the weight of materials and plant needed for airfield construction: the development of the tracked undercarriage to enable aircraft to operate from roughly levelled ground should not be

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overlooked, while the recent announcement of the successful trials of sprung decks on aircraft carriers suggests that such a development may now be within reach of shore-based aircraft. Whether it would prove practicable to develop the naval technique of accelerated take-off and retarded landing to a stage at which heavy aircraft could be operated, or to develop the ground equipment involved to be air-transportable, must remain conjecture; but this field is one which offers promising rewards and development should be pursued with vigour.

A different sphere in which advantages appear to lie is that of flight refuelling. If, as appears likely, further evolution of the long-range bomber leads to aircraft of much-increased size, flight refuelling might well enable them to stage between their operating bases, and so preclude the need to enlarge or reinforce runways at intermediate staging posts. In addition, tankers based near the oil refineries might effect a useful saving in transportation requirements for fuel.

Although, therefore, after a period of development along these lines, we may expect some reduction in material requirements, this is likely to be relatively small, and it is evident that it is to a reduction of "maintenance distance"[1] that we must look for that immediate and considerable improvement necessary to increase our strategic mobility to an acceptable level.

ATTAINMENT BY REDUCTION OF MAINTENANCE DISTANCE

Dispersal of Commonwealth Air Supply Industry

At present the United Kingdom is the only industrial base available to support the R.A.F. throughout the world, and the ability of our forces to move to and operate from overseas theatres of war is hampered by the enormous distances over which they must be maintained. In addition, the vulnerability of the United Kingdom to modern weapons might well deprive them of this support just when it was most essential. The establishment of other industrial bases to support our forces operating overseas is therefore a vital requirement to increase both strategic mobility and security of supplies.

The formation of a co-ordinated Commonwealth defence plan has long been advised by authorities on Imperial defence, but the infringement of national sovereignty it involves has prevented it reaching fruition. **But a Commonwealth maintenance plan would affect primarily the economic rather than the political sphere and so might more readily be achieved.** In addition, the fact that the production of material for air forces does not entail much heavy industry suggests that it may already be practicable to apportion that part of the world from which the R.A.F. might operate into geographical zones, in which all Commonwealth air forces would be maintained as far as possible by the industries and resources of the Commonwealth territories within that zone.

It is beyond the purview of this article to consider in detail this zoning of maintenance or to recommend which members of the Commonwealth should provide the main support bases. *Prima facie*, however, Canada appears suitable for the Western Hemisphere and Australia for the Far East, while the United Kingdom must inevitably remain responsible for the European theatre. The Middle East provides greater difficulties, although the expanding of aircraft and associated industries in India and South Africa should be both feasible and of

[1]For the sake of clarity, the term "maintenance" is used throughout this article to denote the functions of manufacture, supply, repair and reconditioning of all material required to support air forces (including complete aircraft). The term "maintenance distance" thus denotes the distance between the area of operations and the industrial base responsible for the "maintenance" of the force.

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economic benefit to them. It is possible, however, that the entire dependence of our Middle East forces on these countries might be politically undesirable, and it is interesting to note that progressive thought in the Army[2] favours the formation of an industrial base in East Africa using local resources of raw material and coal.

It is advisable in peace to develop a nucleus of that organization required in war. Although, however, immediate action must inevitably be limited in respect of the Middle East to far-sighted consideration to determine the support base(s) for that theatre, and in respect of Canada to defining her responsibilities, immediate steps might well be taken to transfer responsibility for maintenance of the forces in the Far East to Australian industry. It is perhaps fortuitous that a precedent has been created by the placing there of contracts on a small scale for the overhaul of certain equipment, but these might well form the nucleus of the extended scheme.

It should therefore be immediately practicable not only to consider but, in respect of the Far East, to commence to implement, a general maintenance plan for all R.A.F. forces operating overseas, in which, though functionally controlled from the United Kingdom and organized as at present, they would be maintained by the nearest suitable industries within the Commonwealth.

Several industrial bases dispersed throughout the world producing appropriate air material would so reduce the "maintenance distance" of R.A.F. overseas forces that a considerable measure of strategic mobility would be assured.

Revised Maintenance Organization

Acceptance of this conception will call for the preparation of a specific maintenance plan for each operational theatre to decide to what extent it should be self-supporting, and to what extent it should rely on its regional industrial base. In most overseas regions the theatre of operations is likely to be so far from the industrial base that a repair and supply organization will be required in the theatre in addition to mobile servicing units operating with the forward forces.

The preparation of a plan to define the respective responsibilities of the servicing units, the repair and supply organization, and the industrial base, and its implementation, will require a revised maintenance organization with the closest integration of technical, supply and industrial standpoints. Though ultimately this may best be provided by a closer association of the technical and supply branches of the R.A.F., it may in the interim be possible to establish some co-ordinating machinery within the Air Ministry able to confer as necessary with the Ministry of Supply and relevant Ministries throughout the Commonwealth.

Only such close co-ordination could provide a maintenance organization which would enable the R.A.F. to reap the full benefit of that mobility which the dispersal of air supply industry throughout the Commonwealth would make available.

CONCLUSION

We have considered the principles of war, sought the lessons of history, analysed current obligations and endeavoured to probe the future: each postulates that only the development of strategic mobility to a pitch never before attained can enable the R.A.F. to cover its widespread and increasing commitments.

We have examined briefly current progress, and have seen that it is unlikely

[2]Bertrand Stewart Prize Essay for 1948. Major B. H. D. Barnes. *Army Quarterly*, January, 1949.

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that any appreciable increase in the amount of material that can be moved by air will be achieved, and that, although in time a useful reduction in the quantity of material required can be expected from the development of the tracked undercarriage, the naval technique of accelerated take-off and retarded landing, and flight refuelling, research on all of which should be pursued with vigour, it is primarily to a reduction of "maintenance distance" that we must look for that immediate and considerable improvement required.

Consideration of this requirement indicates that it is not only desirable but practicable to disperse our air supply industry throughout the Commonwealth and to apportion our overseas operating areas into zones in which all Commonwealth air forces would be supplied as far as possible from the industries and resources of the Commonwealth territories within that zone. This would so reduce the "maintenance distance" of the R.A.F. forces operating overseas that a considerable measure of strategic mobility would be assured.

The full measure of advantage could, however, only be reaped through a revised maintenance organization. Though ultimately a closer association of the technical and supply services at all levels may best provide that fully integrated conception that the complexity of the problem demands, in the interim it may be possible to establish some co-ordinating machinery for this purpose.

We have seen the need, considered the problem, and indicated the nature of the solution. Only a Commonwealth Air Forces Maintenance Plan, supported by a co-ordinated maintenance organization within the R.A.F., conceived with foresight and implemented with determination, will enable the R.A.F. to achieve that strategic mobility by which alone can Britain develop an air potential commensurate with her prestige and authority in world affairs.

THE DESTROYER AIRCRAFT WITH SATELLITE ROCKETS

(*Continued from p. 16*)

the use of other earthbound projectors allows the attack to approach too close even if it can make the density of missiles lethal. The use of a satellite rocket system is obviously not one that can ever be adopted against single aircraft with advantage because the missiles themselves are more expensive, and difficult, to produce than present cannon armament. It will come into its own when the size of the opposing formation is sufficiently large for a pilot-operated radar set to give a good enough interception without search but when he is on the general line of advance.

There is no doubt that the present-day fighter aircraft is going to be of little use against enemy formations flying high at speeds approaching that of sound. Their destructive power is so limited that they can only harry or mix with the escort. There are considerable technical problems in the development of speed-controlled missiles as visualized here and in harnessing them into a satellite system, but the many advantages make the work involved well worth while. The essence of this scheme is to overcome the two shortcomings of the main defence methods now coming into use by launching at short range the hard-hitting homing weapons. It does, however, suffer from the chronic complaint of all inventions that are invented in peace time with the intention of waging a more bitter war and that is that its true tactical uses cannot be developed until it is employed on a grand scale against a hostile target. In the meantime, the potentiality can be proved and the scheme put into production.

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[Photo by courtesy of Mr. S. M. Evans, M.B.E.

Civil defence in action after a direct hit on shops in Ealing by a flying bomb

[Photo by courtesy of Mr. S. M. Evans, M.B.E.

Rescue work in progress after the explosion of a flying bomb at **Hornsey**

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FUTURE CIVIL DEFENCE

By Wing Commander Sir John Hodsoll, C.B.

CIVIL DEFENCE is now in the process of being established as a permanent part of the defence system of the United Kingdom; as a complement, in fact, to the active defences.

The primary role of Civil Defence is to reduce both the casualties and the damage which might be caused by any form of aerial attack, or indeed even by sabotage. The main object behind this role is the maintenance of the morale of the civil population, with the secondary, but nevertheless vitally important, objects of helping to maintain the life of the country and its vital production at the level necessary for the successful prosecution of the war.

If these objects are to be achieved it is essential that the active defences, in conjunction with such offensive operations as can be undertaken, together reduce the potential scale of attack on the United Kingdom to proportions that will enable the Civil Defence Corps, and its allied services, to have a reasonable chance of dealing successfully with the casualties and damage caused. Once control of the air over the home country is lost, then the task of the Civil Defence Corps will sooner or later become impossible, as happened ultimately in Germany and Japan.

It must also be remembered that Civil Defence is designed primarily to deal with the effects of strategic bombing. Once the home base becomes the object of tactical as well as strategic bombing on an increasing scale, then the whole position will rapidly deteriorate.

In considering the organization and establishment of Civil Defence, the question of man power is one of high importance. The ultimate defeat of the enemy's intentions will be accomplished by offensive action. It is important, therefore, that the Civil Defence Corps and its allied services should not compete with the Fighting Services, on whom they must rely to keep their problems within reasonable bounds, in such a way as seriously to impair their capacity for offensive action. It is equally important to avoid undue interference with vital industry, and for these reasons, with few exceptions, Civil Defence should, in the main, be recruited from the higher age groups and should also in peace time rely almost wholly on volunteers.

The first problem in organizing Civil Defence in the United Kingdom is to provide a reasonable measure of local protection over the whole country; the strength of local organizations being adjusted to meet, so far as possible, the vulnerability of their respective areas. This part of the organization constitutes the local static defence, which is designed to take up the first shock of any attack.

Behind this local echelon it is important to provide strong mobile forces to reinforce quickly any area in which the situation has got beyond the resources of the local forces.

In considering these dispositions it is also necessary to have regard to the effects of modern attack on heavily urbanized areas, and to ensure that a substantial proportion of the forces are positioned so as to avoid undue casualties to their personnel and damage to their equipment before they have had a chance to go into action.

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On this basis, therefore, it is proposed in all principal authorities in the country, i.e., the county boroughs and county councils, to raise a local division of the Civil Defence Corps, which will consist in England and Wales of the following six sections—Headquarters, Warden, Rescue, Ambulance, Pioneer and Welfare. In Scotland there will be no Ambulance Section in the local division, since the ambulance service will be run centrally.

A word of explanation about the functions of these divisions is necessary to understand the defence pattern. The Headquarters Section will consist, in the main, of personnel who will be responsible for the control of Civil Defence operations and the manning of control centres, together with certain personnel required for various forms of reconnaissance, communications and public relations. The Warden Section is well known and speaks for itself, as does the Rescue Section and the Ambulance Section. The Pioneer Section will be concerned with a variety of tasks, such as debris clearance, first-aid repairs to houses, first-aid repairs to public utility services, i.e., water, gas, electricity and sewers, decontamination and various other tasks which fall appropriately under the heading of "Pioneer." The Welfare Section will be concerned in the main with what used to be called post-raid activities. In other words, those activities which are concerned with the troubles and difficulties of persons who have been bombed out of their homes, or are in other trouble as a result of enemy action. This section, therefore, will be designed to deal with problems of billeting, emergency feeding, the supply of emergency clothing and other matters, all, in the main, concerned with the welfare of victims of bombing.

The setting up of these local divisions is to be the first step in the reorganization of Civil Defence. Once this step has been accomplished and the local divisions are firmly established, then it is proposed to start recruiting, from the local divisions in the main, the mobile columns which will form the main striking force of the Civil Defence Corps. While the local divisions will be raised and looked after by the local authorities the mobile columns will be centrally controlled and directed, although help may be required from the local authorities in organizing and training them.

Behind these two echelons will come the Army, which has undertaken to come to the help of Civil Defence, if required, subject to certain overriding operational considerations which must clearly have priority, e.g., the repelling of an attempted invasion. In order to fulfil this role, the Army has undertaken certain training commitments which will chiefly be of a staff nature, though they will include some elementary rescue training.

In regard to the Royal Navy and the Royal Air Force, these two Services have a responsibility for their own premises and property and cannot, in the nature of their duties, undertake any specific commitment to help the Civil Defence Corps. As in the last war, however, mutual aid will clearly have to be worked out in peace time, and there is no doubt that, circumstances permitting, they would render assistance at any time or at any place where forces were available. All three Fighting Services have, therefore, an interest in Civil Defence, firstly because on its efficiency will depend the maintenance of their main home base, and secondly because, either for the protection of their own property or in support of Civil Defence they will require a general practical knowledge of Civil Defence work.

It must also be remembered that, if fighting from overseas bases where United Kingdom Civil Defence personnel will not normally be available and where, possibly, the local Civil Defence of the country concerned may not be in very good shape owing to enemy action, the Fighting Services may be vitally con-

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cerned to ensure that there is a proper Civil Defence organization for the protection of their bases. A very good example of this requirement in the last war was Antwerp. In default of a civilian organization the Services may have to undertake the task themselves.

In training the new Civil Defence Corps there are a number of completely new problems, on the solution of which a great deal will depend. The scale of bombing attack to which the United Kingdom was subjected was immeasurably less than that which was experienced by Germany or indeed by Japan. The modern technique of saturation bombing, together with the atomic bomb and perhaps other new weapons, has made the problem very much more extensive, and the evolution of new tactics is, therefore, of the highest importance. It is suggested, for example, that aerial reconnaissance might be a very important requirements. For example, if gas were used, or if radio-activity were suspected, quick and broad picture of the area of devastation, to enable them to decide how best it can be attacked and by what particular methods. There will also, apart from aerial reconnaissance, be highly important tactical ground reconnaissance requirements. For example, if gas was used, or if radio-activity was suspected, it would be a matter of urgency to find out full details and particulars so that decisions could be taken which would affect the operations of the Civil Defence Corps, and action could also be taken to safeguard and protect the civil population so far as possible.

Modern methods of attack inevitably produce big fire and rubble problems. The advent of the fire storm, as experienced, for example, at Hamburg and Hiroshima, is something quite new, and the blocking of streets with enormous quantities of rubble may make the problem of rescue infinitely harder and also the approach to the area. There may be occasions, therefore, where a waterborne approach may be the quickest and simplest, and for this reason a proportion at least of the Civil Defence forces ought to be trained, in due course, in amphibious operations.

It is in the solution of tactical problems of this kind that the help of the Fighting Services can be very great. They have had much experience of operations of this nature, and, although the circumstances may not be quite the same, i.e., landings would be unopposed in the sense that they would not be subjected to direct enemy counter-action, the opposition provided by large fire areas, huge areas of rubble and possibly areas contaminated by radio-activity will perhaps be just as testing in their own way.

It will be the object to teach the Civil Defence Corps and its allied services the best methods of protection against all the various types of risk, and through them gradually to try to get some knowledge to the general public. All experience in the war went to show that the importance of telling the public the truth and not making any attempt to minimize possible dangers was the surest way of getting their whole-hearted co-operation and maintaining their morale. In these days of mass-destruction weapons and the dangers of an attack of a nature hitherto unknown in this country—and perhaps not fully realized at present—it is vitally important to do everything to safeguard the public against a tactical or even a strategic surprise. One of the most important tasks of Civil Defence will lie in this direction, and ultimately perhaps in helping to get some training to the civil population itself in methods by which it can do something towards its own protection.

The facets of Civil Defence are very wide indeed and only the Civil Defence Corps as such has been mentioned. The emergency medical organization will be based primarily on the National Health Service; and factories and important

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undertakings will have to play their part and be responsible for their own protection so far as possible, as was the case in the last war. Plans will be needed for shelters, evacuation and all the other many problems which modern bombing produces.

There are many other matters which lie outside the strict scope of Civil Defence but which are nevertheless vital if the country is to be properly organized to meet at the outset what may be a very heavy scale of attack, not the least of which would concern the question of stockpiling, protection of ports and so on. Modern war is liable to interfere with the internal economy of the country in almost every aspect, and it is the object of Civil Defence on the one hand and other organizations on the other to try to foresee where this disruption may occur and to make plans so far as possible to meet it.

Although the coming of the atomic bomb and other weapons has enormously complicated the problem, and while destruction of property may be impossible to avoid, it is very much hoped that the destruction of life and the general disruption which such bombing might cause, can be very greatly reduced by proper Civil Defence planning and organization, and proper training. To stand up successfully to modern attack, however, does require, in fact, a very big combined operation in which the Service Departments have a vital interest and may have to provide at times active co-operation. A good Civil Defence Service is essential in modern war, and if it is to be effective it must be organized and trained in peace. But it is essential to have a proper balance between the active and the passive defences, because although Civil Defence could perhaps lose a war it could do nothing active to win one.

A TANGLED TALE

1. Every Monday, Tuesday and Wednesday a pilot, navigator and engineer fly a passenger plane from London to Glasgow, arriving in Scotland at 2330 hrs. On other days of the week the crew are off duty. On 2nd March, 1949, Smith, Jones, Robinson and White made the journey (two passengers, three crew).

2. John is the landlord of "The Red Hart" at Islington: he has an unmarried (but legitimate) daughter—Kate. The navigator, a single man, lives at Newcastle. Smith's late wife was an A.T.A. pilot and he is as capable as she of flying an aeroplane.

3. Last night (1st March) Kate stayed to see Robinson—a bald-headed man—beat Brown at billiards, though it was nearly eleven when they finished. Twenty-four hours later Smith, a widower, became engaged to Kate and kissed her tenderly.

4. John alleges that White spies on customers at "The Red Hart" from his home on the opposite side of the road.

5. What is the surname of the landlord of "The Red Hart" and what are the individual names of the pilot, the navigator, the engineer and the passengers?

(*Solution on page 92*) H. R. P. P.

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RUSSIA—SUBSTANCE OR SHADOW?

By Flight Lieutenant J. J. Harding, B.E.M.

INTRODUCTION

OVER the world today there lies a shadow—the shadow of Russia. It lies over breakfast and conference tables alike. It looms in the minds of politicians, seeming to mock at the power votes should give. It sends strategists a-seeking new defences for what yesterday they thought safe base areas.

Is there substance behind this shadow? Is there a small body, casting a long shadow in the rays of democracy's setting sun? Is there some huge bulk indeed, in true proportion to the gloom? Or do we start and sweat at a bogy of the night as children do when overtired? Will the bogy fade in the dawn, and can we hasten this dawn?

There is much woolliness of thinking about Russia and Communism, such acceptance of the latter and so little effort in tackling it. The two are bracketed, accepted, speculated upon, but never dealt with in any direct way. Russia is regarded as an enemy already, and Communism as a sore on the body politic that can be dressed as it erupts but not cured. Before we finally subscribe to this gloomy dread, let us from the sunshine fairly examine it.

FRESH HISTORY, OR NEW PHASE OF THE OLD?

First, is this the first time in history that Russia has cast a shadow? Or is the label "Communism" being tied to an old spectre?

It is no new thing. The "armed neutrality" of 1800, the Afghan Wars of 1839-49; Canning's policy in the Morea in 1827, Gladstone's in Afghanistan in 1885; Pitt's and Russell's concern over Prussia in 1791 and 1853; our failure to support the Slav freedom movement in the Balkans in 1878; our alliance with Japan in 1902—all fumblings for a policy to check Russia. And after the First World War our perhaps most pitiable fumble, the campaign in aid of the White Russians.

The U.S.A., too: her Monroe Doctrine in 1813 arose from fear of Russia's designs on the Pacific seaboard.

If a bogy of the night, it has been a curiously long night. Are we guilty of the contempt which familiarity breeds? Have we made a habit of fear? We must remember: fear is a brother to hate; that way lies destruction.

INSIDE RUSSIA

Secondly, it seems to be commonly accepted that behind the Iron Curtain lies a land of which we know nothing. Count the books, pamphlets and articles written on the subject—some people have a lot to say on nothing! The truth is, there are thousands of facts on which to base deductions, policy and strategy. Ostrich-like, we keep our heads in the sand and say we are mystified by the Slav.

Summing up all we know, three major aspects of life inside Russia appear, with obvious bearings on our relationship.

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To begin with, there is squalor in many large areas because of the move of the population from country to town. This move is a parallel to the one that gave England her slums in the early nineteenth century, those as yet unhealed wounds. These slums are not lightly accepted by the régime, nor are they the fault of the Government, or any reflection upon Communism. They are the result of a mass migration beyond the control of any party or faction. The Communist Government is alive to the situation, and includes house planning in its over-all economy. The slums will go, in time; but for the present they remain, to be explained or excused to their occupants.

Then there is the complete ignorance of the majority of the people of our lives. The first reaction to this is an old one: "Thank heaven for our free Press!" But does this ignorance argue a mighty censorship? Beyond the almost warmongering headlines, what news of inner Russia has our Press ever carried? True, the Russians' ignorance is not attacked by truth by the Communist rulers, but there is little need. Our Press would print more news from the steppes if it was called for, but in England as everywhere the most-read news is the most-understood news. That means that happenings in other lands have to be spectacular, almost on earthquake level, to make our columns. Now, Russia is not just one nation and state. Sixteen republics go to make up that empire. Sixteen neighbours, with varying tongues, creeds and customs, but still neighbours. A major domestic event in Azerbaijan may stir the Press of Georgia yet be but back-page stuff in the Ukraine. The headlines are easily filled, eagerly read without much governmental pressure to exclude Western news. Ours are much the same. What room, then, for full knowledge of England, France, the States? True, among the intelligentsia Shakespeare and Dickens are widely read, but as tit-bits of the universal feast of literature, not to broaden national knowledge.

In Russian political life there is complete acceptance of Communistic rule. It is a rule of a minority, for only some six millions at most out of an estimated one hundred and sixty millions are members of the party, and membership is essential for holding Government jobs. The remainder could be loosely labelled "Socialists," with degrees of truth by our notions. Communism is preached, and the party aims at eventual conversion of all the peoples in the Union. But at present Socialism is the political religion internally. Yet because the party mans the Government at all levels, and the sixteen republics speak by common consent with one voice, externally Russia is Communist. This is accepted, perhaps vaguely understood, by all within; we could not accept it nor can we readily grasp the mentality that does. But in a land that never had a complete revolution, only a change from one type of autocracy to another, and where choice of rulers does not in any sense mean voting for men to implement a popular policy but rather putting in office those who will shape one, the people have a tradition of firm central rule never to be criticized, much less attacked—unless it at the same time exasperates and shows weakness. There is therefore no "underground" in Russia, no anti-Communist core of resistance, though paradoxically the people would not vote in a Communist government if Socialist candidates were allowed. They accept from their rulers the dictation "We are cleverer, more gifted and experienced than you. We have the inclination and ability to rule. So it is obvious that we know best the policy you should follow. Leave it to us. If you don't you are foolish children and must be disciplined." At best the Russian probably regards his elections as a waste of time, a compliment to his rulers, but honestly accepts absence of rivals as a clear indication that the weeding out has been done for him and the best men for the jobs are waiting his vote.

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So inside Russia we see a land where

(*a*) Perfection and paradise have not yet arrived, and bad things exist beside ideals achieved. Therefore discontent can also be, to be placated or suppressed as is expedient. And it may be expedient to distract attention from failure in internal economy by vigorous action abroad. Great Britain may be the whipping-boy for Bokharas sanitation, though Moscow well knows that wars do not mend drains but delay repairs.

(*b*) Ignorance of the outside world is no more widespread than in any other comparable block of nations, but, whereas elsewhere a vigorous curiosity by the few is encouraged and fed, and in time will be satisfied, in Russia this is not so.

(*c*) The Russian character will leave the Communists in power without resentment all the time they are firm, offer progressive plans, and at least appear to be dealing with all obvious evils.

WHAT IS COMMUNISM?

Communism is a positive creed. It does appear to offer relief to a man's agony of frustrated desire for betterment in his time, though he is in his generation incapable of using betterment. In this attraction for those who do not fully understand it lies the great danger.

The world over, people no longer accept poverty as inevitable, or misery as their national lot. Frontier-bestriding urges blindly seek new life. Only Communism offers immediate, positive action. That it is suicidal is not obvious. Unless Christianity realizes that politics today include religion, that every step of life from cradle to grave is being made the business of everyone either at first hand or by proxy, that people are realizing the existence of the brotherhood of man in practice or in mystic ideals, and that they need this brotherhood explaining else they get distorted views, then Communism's offer of physical food for spiritual hunger will be accepted. And spiritual starvation will go on.

What are the tenets of this creed? Its prophet, Marx, believed, and so do his disciples, that all the means of production and wealth of mankind are the yardsticks by which the social structure can be measured. The tools improve, but the state of society lags behind, because those in power want no change, and at intervals society is far behind its potential. The difference is unacceptable, and there occur from time to time sudden adjustments, violent or quiet, but final, in that each one results in the annihilation of a class that has held back the progress of humanity. So go out class by class the enemies of perfection, said Marx, and now today his followers say there are but two classes—the capitalist and the proletariat. And the gap between the fine, much-improved means of livelihood grows fast, because science gives out its finds faster with the years. The last conflict, between the last antagonists, must come soon or the gap will be too wide to bridge. Conflict is inevitable, the annihilation of capital inevitable too. There can be no compromise or gradual change.

So much for Marx. He should be read and studied, boring as he is, for to know one's enemy is common sense. But he had no idea of a small political party quite apart from the class they were to free. He envisaged a vanguard within that class who would be victors or martyrs. Lenin, prophet number two, developed the idea of a party that might seem for a while to represent a third class, distinct from the working class as a whole. To quote from his *One Step Forward, Two Steps Back*:

> "We are the party of a class, and . . . in the period of civil war the entire class should act under the leadership of our party, should adhere to

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our party, as closely as possible. . . . To forget the distinction between the vanguard and the whole of the masses which gravitate towards it, to forget the constant duty of the vanguard to raise ever wider strata to the most advanced level, means surely to deceive oneself, to shut one's eyes to the immensity of our tasks, and to narrow down those tasks."

To go farther into the vagaries of Communist doctrine is to discover other poor logic, like that of preaching a one-class Utopia by a party that is warned not to identify itself with the masses. But so few go into the creed; they pick out odd phrases for mottoes, like the one above: "The constant duty of the vanguard." Mottoes for a crusade. This new "ism" is more a religion than a political doctrine. And religions inspire even if not fully grasped or accepted. Many Muslim fanatics take alcohol, and Lion Heart's Crusaders were not all mailed monks. Communism has a banner, and so gains followers. It is a minority and therefore interesting. It is apparently on the side of the underdog, and gives no distinction between the dog knocked down and the one who spinelessly lies down.

The very subtle but tremendously important difference between the Socialist and Communist economic theories is easily glossed over. Says the Socialist: "From each according to his ability, to each according to his labour." The Communist says: "To each according to his needs," and is easily mistaken for an advanced democrat instead of the bigoted radical that he is. The existence in Russia of many "capitalistic" or Socialist privileges—private property and the right to inherit it, high wages in important jobs (surely "according to their labour"?)—that leads to an aristocracy of money, means no stress on this great divergence of what must not be regarded as two Red parties, Left and Extreme Left, Advanced and Very Advanced Thought.

CONCLUSION

Clausewitz defined war as the continuance of a political aim. Since the aims of Russia and the Western Powers are diverse, and we cannot fall into line with her, then war appears to be inevitable, the shadow to become substance.

The Communist Party theory of revolution seems tangled inextricably with Russian national policy.

But there are factors that give grounds for hope, and the first is the one that all Russia is not yet converted to Communism. An experiment is in progress. A war must delay success for years, and in those years the party policy would modify, mellow, and accept compromise. If it did not, then the failure to provide paradise, the discipline and the purges necessary to keep all members to the purest practices, these would in the end rouse even the docile peoples of the eastern lands to revolt. Already through the years Marxism has passed through Leninism to Stalinism and that has meant a softening inside Russia not seen outside. Delay the final conversion, and it might well never come. We do not wish to fight for this reason; the party leaders dare not. It would be useless to win a war abroad and then have to forgo the victory at home.

A second factor is that Communism, in common with all such creeds since time began, fishes best in troubled waters. When, after any upheaval, humanity ceases to cry in crowds and to tend individual hearths, the enthusiasm for banners and marching dies. Though the world is far from settled it is less disturbed than four years ago. The very conferences, that with much talk get nowhere, have indirectly helped. We have marked time to watch them; and time heals, for the common man, finding nothing but promises outside his own door.

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tidies and tends his private wreckage, and with a roof and peace loses much of his riotous dissatisfaction. Russia, as we have seen, does not want war, because it would kill Communism. Communism does not want peace, for that means the end of its breeding places—pockets of hungry, terrified, blood-crazy people.

So the "cold war," the greatest disturbing element the Russian politician dare let the Communist use. More would mean real war, less would be peace. Either the end of the party as we know it.

Clausewitz was right: war is the continuance of a political aim, but the aim may be changed. Here it will be if we add our own factor to the scales, to meet the unpredictable, the fanatical element that may outweigh the cooler heads in the Kremlin.

That is, a strong defence backed by clean backyards. These efforts must be less obviously anti-Communist than pro-British, pro-decency, pro-common sense. Communism, almost a jungle creed, breeds in the morass out of which humanity must rise. Every effort of each of us must be to lift our lives upwards from the bog. Each and every one must have honesty in every act, every minute. Mental absenteeism can exist as much in the office and home as in the mine. Capital, with which we are supposed to be rotten, can be a disease. It can also be a wonderful means of gaining security, confidence, independence, upright man-to-man thinking, for country and for individuals.

Russia is no shadow. She is a very tangible community of nations, bound by Communism. The shadow is cast by our own selfish habits, by our guilty knowledge of the perils these habits encourage, the dangers our slackness makes huge. We loathe the morass; we must remember that it is like stagnant water, stationary. We can move. We must, upward.

THE GORDON SHEPHARD MEMORIAL PRIZE ESSAY COMPETITION

The subject for this competition is :

"The effectiveness and striking power of an air force are directly related to the degree of efficiency achieved in the use of its men, equipment and training time. Discuss this theme and suggest any means by which, in your view, the efficiency and striking power of the Royal Air Force can be increased without increasing its proportionate call on national resources."

The prizes offered for this competition, subject to the requisite standard being reached, are as follows :

First Prize : £50.

Second Prize : £30.

Third Prize : £20.

Full particulars can be obtained from Air Ministry Order N1047/1949.

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During an interval Lord Tedder chats with Mr. Russell Vick, K.C., Chairman of the civilian team, who summed up the conference

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"ARIEL"

By Wing Commander A. G. T. James, O.B.E.

I come
To answer thy best pleasure: be't to fly,
To swim, to dive into the fire, to ride
On the curl'd clouds: to thy strong bidding task
Ariel and all his quality.

—*The Tempest.*

INTRODUCTION

THE aim of this article is to describe briefly, for those who were not present, something of what went on at the Chief of the Air Staff's Conference "Ariel" which was held in London in 1949, and by quotation from some of those present tc give an indication of what it achieved.

In the first place Conference "Ariel" provided a unique opportunity for frank discussion between the Service and representatives of many walks of the national life on the R.A.F.'s major problem since the war, the problem of manning in its broadest sense.

Some two hundred civilians representing industry—both management and labour, universities and schools, the Territorial Air Force and the Air Training Corps, technical and administrative associations, youth organizations, Government departments and the professions—took part in lively discussions with senior R.A.F. officers.

This new approach to a Royal Air Force problem has, in the opinion of an eminent civilian, made history. "It could not have happened," he said, "twenty years ago." A joint approach to the problem was necessary, said Lord Tedder, because the Service man is no longer a separate individual, simply airman, soldier or sailor; he is one unit of national man power who for a period is doing his service for the country in uniform.

It was not the intention of the conference to reach formal conclusions or to decide policy, but to exchange ideas, and one of its most encouraging features was the agreement of all present that the problem was a national one, and that possible ways of overcoming difficulties involved could only be found with the willing co-operation of the civil community.

THE FILM AND EXHIBITION

The fact that in just over thirty years air warfare has developed from bombs of a few pounds' weight to the atomic bomb, from simple aircraft serviced by their flying crew to aircraft with 30,000 to 40,000 different components and costing perhaps half a million pounds was vividly illustrated in the first place by a specially prepared film. "That moving, terrible film and all that it implies," as a civilian speaker said, "has made all of us in this room supremely conscious of what air power means when you have not got it, and all of us realize that we have got to do something about it." The exhibition emphasized in particular the need for men of quality in a highly complex modern air force and showed how great has been the increase in the number of different trades involved.

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NATIONAL MAN POWER

The Air Force manning problem was first considered in relation to the national man-power situation. The speaker on this subject made it clear that there was going to be no lessening of the strain on man power in the future if the country was to achieve economic recovery. He believed, however, that, given co-operation and good will between the Service and civilian communities, the R.A.F.'s recruiting problem was not insoluble. In particular he pointed out that from 1951 onwards the Services would benefit from an annual flow from industry of some 70,000 skilled young men whose National Service had been deferred for the completion of apprenticeship.

THE R.A.F. MANNING PROBLEM

The Air Council Member for Personnel emphasized that the R.A.F. had a formidable training commitment amounting to some 35,000 men per year, assuming as he did for the purpose of his talk a regular force of about 210,000.

Two factors were stressed as having a particularly important bearing upon the manning structure of the Force. The need for quality and therefore of conditions of service attractive enough to compete in a world of high wages and full employment, and a short-service scheme to help keep the Service young and improve career prospects.

Regarding short-service officers, it was suggested that the best hope of overcoming the shortage was "by providing better inducements" and "for a period of service as an officer in the R.A.F. to be regarded as an essential and attractive part of a civilian career." It was agreed that R.A.F. officers and aircrew developed qualities of leadership, initiative and judgment which would be of value over a wide field of industry. "It is in the national interest," a civilian speaker emphasized, "that those qualities should not be allowed to run to waste."

AIRMAN MANNING PROBLEMS

One of the biggest airman problems was the lack of balance between different trade groups. This was particularly bad in the Regular component of the Force. National Service men could fill some gaps but not in the most highly skilled electrical, instrument and signals trades. Regarding recruitment to some less popular trades, active consideration would have to be given to raising the status of these to compare more favourably with civil life. To render the airman's long-service policy both more attractive and more practicable, the R.A.F. Trade Structure Committee had recommended advancement along two main channels, the one being open to those showing particular capacity for leadership, and the other to those showing particular capacity for technical skill.

QUALITY AND ECONOMY

The R.A.F., it was stated, was very alive to the need for using man power sparingly and recognized that quality was a big factor in man-power economy. Bomber Command statistics of the recent war, for instance, showed that, broadly speaking, destruction of a given target required twenty aircraft from the best squadrons and sixty aircraft from average squadrons; in the latter instance, 6,300 men instead of 2,100 men would be directly employed in the operation. "Given the quality," said Lord Tedder, "you will not need such a big Air Force; if you do not have the right quality you are going to waste men and money." The manning problem, therefore, was a qualitative one rather than a purely numerical one.

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RECRUITING AND RESETTLEMENT

"The recruiting problem will disappear," an eminent civilian suggested, "as soon as you can solve the resettlement problem—that is the guts of the matter. This problem," he continued, "is not numerically so formidable . . . the R.A.F. should set up its own negotiating machinery and negotiate with each industry separately, for industry is diverse and so are the chaps to be resettled."

Government and nationalized industries, it was pointed out, are already prepared to take men from the Services, but resettlement in general would be helped if the precise job a man had done in the R.A.F. could be more clearly defined and if boys could be encouraged to work for civilian qualifications while in the Service.

A number of speakers stressed the value of the A.T.C. as a fertile source of R.A.F. volunteers and as a valuable medium for maintaining public support for the Air Force, while schools and voluntary organizations such as Boy Scouts and the Boys' Brigade could also play their part.

THE RESERVES AND AUXILIARIES

In the Auxiliary Air Force the main problem was the fighter control units, as the whole defence of the country depended upon the control and reporting system. A civilian speaker pointed out that the aftermath of war, compulsory service and petrol rationing were factors militating against successful recruiting to a voluntary part-time force such as the Royal Auxiliary Air Force. It would help, however, if the enthusiasm of volunteers' families could be raised by closer contact with Royal Auxiliary Air Force activities.

CONCLUSIONS

The immediate achievement of the conference was that both parties present, Service and civilian, had got to know each other better and had started to find a common basis in a common national problem.

Discussions had shown the human factor to be the governing one both within the Service, where problems of technical organization, training, careers and recruiting must all be considered in relation to the individual, and in connection with resettlement in civil life. As one civilian said: "We want young men to come back to industry better disciplined and with better morale."

Discussion also brought out that there was a two-way responsibility in connection with manning the R.A.F., a responsibility for the Service to make the best use of the human material it receives and to offer reasonable security and career prospects; and a responsibility for the nation to ensure to the Service a proper economical share of the right quality of the nation's man power.

One speaker had suggested that "industry might have to agree to train a man a little outside the general curriculum in order to fit him for his eventual R.A.F. training and the Air Force might have to do the same." Industry might also be able to help in training men to meet the auxiliary commitment.

"We started this conference," said Lord Tedder, "because we felt there was before us and before the nation an important and urgent problem—a problem which is also increasingly complex. One thing this conference has done is that it has shown us far more clearly than we ever knew before what that problem is. That is the first step towards solving it."

The conference itself was not an end but a beginning, a beginning which the Air Ministry and Royal Air Force would follow up in close contact with the civilian community, selecting from amongst the many suggestions made whatever methods seemed likely to produce the best results.

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Airmen crossing a crevasse below Grands Mulet on the descent from Mont Blanc. It was this way that M. de Saussure and Dr. Balmat made the first ascent

The high camp occupied by the R.A.F. for three days at Plan de L'Aiguille at a height of 9,000 feet. On the first night there was a heavy storm which nearly blew down the tents. In spite of the fact that it was August, it froze each night

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THE ROYAL AIR FORCE MOUNTAINEERING ASSOCIATION

Summer Meet in the French Alps

By Wing Commander A. J. M. Smyth, O.B.E., D.F.C.

THEORETICALLY, at least, there is no reason why a party of British climbers should not climb for an indefinite period in the Alps spending as little as five shillings a day. On top of this there will be such overheads as the journey out, cost of essential equipment, and guide's fees if one is employed. Benefiting by last year's sad experience when even our very ropes had to be sold to buy our way out of the country, we allowed ourselves an ample margin. In fact, we estimated that the passage from London and return, the expenditure on ice axes and crampons, board and lodging both at base and in the mountains for fourteen days, and membership fee of the French Alpine Club would not come to more than £25 per person. I am glad to say that many achieved this; though most members, tempted by the sight of luscious food and French cooking, spent a little more. The Club funds paid for the services of one guide for the period, more as an insurance against disaster than a *sine qua non* of the expedition.

So it happened that, under the able management of Flying Officer Bob Dixon, ten climbers assembled on 1st August at the base camp set up beside the mountain railway from Chamonix to Montenvers, about a mile outside the former town. We came by various methods and by various routes. But the majority used their warrants to Newhaven, thence by ticket to Dieppe, and finally on a party third-class ticket which only cost £4 15s. return per person for the thousand miles to Chamonix and back. Altogether it cost little over £10. Personally I arrived by Morris Eight, doing 420 miles on the second day to arrive the same day as the train party who left London at the same time as myself.

The base camp consisted of two 30-lb. ex-Army Arctic tents designed to keep out snow; maybe they would do this better than keep out rain, which they certainly did not. However, the weather started so hot that we slept outside in our sleeping bags, to be greeted with a tremendous ovation when the first load of trippers chugged up to the Mer de Glace on the 7 a.m. train. We managed to get the car into camp and this served as an invaluable lock-up when we were away. The first morning was taken up with shopping and fixing up with a guide —Roger Simond. In the afternoon we took the little train up to the Mer de Glace, the great glacier a mile wide and ten miles long which drains the northern approaches of Mont Blanc. There, amongst the crevasses and seracs, we hacked our way until the sun reddening the peaks above sent us racing down to Chamonix on foot; we beat the last train by yards.

Chamonix is 5,000 feet above sea-level. The peaks themselves vary from 12,500 feet to 16,000 feet. Since 8,000 feet up and down is good going even for those in full training, it is usual to begin the day at huts placed at about 10,000 feet, and for this reason we had joined the French Alpine Club. But just where we wanted to start—above Chamonix itself—there was no hut, but only a primitive hotel which charged exclusive prices. We therefore decided to place a high camp at Plan Les Aiguilles, nearly 9,000 feet above sea-level. This may be reached by ascending the Pelerins funicular and walking along the high-level path for two miles, and up this lazy route we sent half the party heavily laden

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with two tents and four days' food. Up the path through the forest walked the rest of us, intent on quick acclimatization, but more lightly loaded with 30-lb. rucksacks. It was a weary walk. Moreover, the sight of the Alto-Cumulus-Lenticularis gathering in the west did nothing to improve our morale. When at last we gained the plateau we had to pass the hotel, where any money we may have saved by avoiding the funicular was spent twice over in beer.

The camp was pitched when we reached it at sunset, and a cold wind worried the flames of our Coleman petrol cookers as we prepared our evening meal. Clad in every stitch of clothing we could assemble we crept into our sleeping bags long before the last light had faded. We did not intend much for the next day; perhaps the Petite Charmoz, a rock peak of some 10,500 feet, not requiring a pre-dawn start. With nightfall, the wind increased in intensity until the fabric vibrated like drum parchment on the windward sides of the tents. At midnight the first rain fell and scuds, driven horizontally at great speed, beat on us with all the fury of Mussourgsky's Night on the Bare Mountain. The water, forced through the seams, ran in rivulets to the built-in ground-sheet, and there, lacking the momentum to force its way out again, gathered in a steadily deepening pool, forcing us to cut a hole at the lowest point. And then it happened. Two guy-ropes parted together, and we were out in it all, fighting for our very existence.

But somehow we saved the situation, and by dawn the storm had abated so that we could make a 7 o'clock start over the moraines and glaciers to the bottom of Petite Charmoz. By any standards, the climb was easy—800 feet of gully and a long ridge of firm rock where the only danger was the thousand-foot drop on either side. Besides our eleven, there were at least another fifteen locals ahead, and the place almost resembled Tryfan on a Sunday. The way down lay in a longer gully of loosened shale, without the patches of snow which might have bound it together in any normal summer. We were lucky to get down this without someone stopping one of the stones which fell in whining showers with the velocity of meteorites.

We were back in camp by mid-afternoon, resting where the warm sunlight fell and the chill breeze did not. Few had slept the previous night. Therefore we were in bed by 7 p.m. and slept as rarely before, until the alarm went off at 2 a.m. It was freezing outside and so we cooked our porridge still wrapped in our bags, and left camp half an hour late at 3 a.m. (This is quite a normal time to commence the day in the Alps, since the frozen snow is crisp and firm to walk on before dawn; by 10 a.m. it has become slush in the hot sun, one's face is blistered by the reflected heat, and the avalanche danger is nearly at its worst.) The stars were brilliant in the thin, clear air, and far below the street lamps winked. With swinging candle lanterns our party wound among the rocks. In front and behind, specks of light showed where other parties moved—"so far these little candles shed their beams." Sparks flew from the iron-shod feet of the British, while the French walked darkly on rubber soles, and reached for their crampons at the least suggestion of ice. But night's candles were burnt out when we stopped at 5 a.m. at the foot of the Glacier des Nantillons. Now was the time for everyone to put on crampons.

Roped together in threes, we made our way up the glacier quickly. The ice was bare, and what crevasses there were could easily be avoided by alternative routes. After picking our way amongst the moraine debris below, this seemed a highway, albeit a highway whose gradient became steeper and steeper. A patch of rock and we came to our first snow. Now it was necessary to proceed with greater caution, with the leader of each three out on a longer length prodding the snow where it looked as though it might collapse and precipitate him into the

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frozen depths. Sometimes a swift stroke with the ice-axe made a foothold on a steep surface. The ascent had been quick and already the first effects of altitude were apparent in quickened breathing and frequent rests—effects which are most apparent in aircrew because their imagination magnifies any physical weakness. Behind, the sun had risen successively on distant peaks, and now fell on the snow at our feet. We put on our sun goggles and took off our sweaters, for it would shortly be very hot.

We were now at the top of the glacier, and, to leave it for the rock of the Blaitiére which we were to ascend, we had to cross an ice couloir—a gutter in the ice down which there skimmed from time to time large and small stones—skimmed, moreover, at a very high speed. The guide first cut steps across, and one by one we ran to the shelter of solid rock beyond. A thousand feet of mediocre rock and we stood on the top, nearly 13,000 feet above sea-level. They say there is a sense of solitude that crowns a mountain peak. No solitude crowned Blaitiére that day, for some thirty-odd people were gathered together upon her confined summit, but the view over the Chamonix Aiguilles towards Mont Blanc was breath-taking. It seemed incredible that rocks could balance themselves in such precarious positions and yet survive the storms and buffets of the wind. It seemed equally incredible that such sheets of ice could cling to the apparently vertical sides of each peak without peeling off like bark from a dead tree. But one cannot spend long on a high peak before consciousness of the descent before one begins to make itself felt. So down we went.

The way down was easy, except in one place, and this we avoided by two abseils, or, in French, rapels. This consists of sliding down a doubled rope and then pulling the rope down after one—a method frequently used when the angle exceeds the vertical. Again we reached camp by mid-afternoon, and again we were early to bed, but shortage of provisions alone determined that the next day would be the last at this particular site, quite apart from a strong desire to get to the fleshpots of Chamonix which lay seemingly a stone's-throw away.

On this the third day's climbing we divided into three. I led a party of four on the Grepon, Roger Simond took another three on the Peigne, while the rest moved most of the camp down to the valley. All were successfully carried out. Perhaps the Grepon is worthy of mention, as it was once considered about the hardest rock climb in this part of the Alps. It has been honoured by a four-foot statue of the Virgin Mary cast in lead, fixed to its summit. The mountain is about 12,600 feet high and consists of an immense flake of rock standing on edge; the ridge thus formed is barely a yard across, and the sides are vertical for two thousand feet or so, the whole being made of the finest rock imaginable. The climbing itself is spectacular rather than advanced, although the Mummery Chimney and final pitch might be classified "very severe" according to British categories. After a 2 a.m. start we reached the top at about midday. This brought difficulties with the soft snow on the way down, especially as we had left our crampons and boots at the foot, and had to descend the glacier in gym shoes. However, we reached camp by 6 p.m., and walked down to Chamonix thereafter, to end a twenty-one-hour day at 11 p.m.

After two days below where heavy rain forced us out of our tents into a barn we moved up to the Couvercle Hut for ascents of the Moine and the Courtes. Down in Chamonix again the party voted unanimously for the normal route up Mont Blanc, and so we set off at 8 a.m. one morning by bus to Les Houches, where we caught the funicular up to Bellvue and joined a throng of people waiting for the Mont Blanc railway. After an hour there arrived a steam train of incredible age and decrepitude, designed to seat sixty. The first sixty had been

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Flying Officers Parish and Dixon reach the north peak of the Grépon

carefully selected and briefed, ourselves among them, but on the arrival of the monstrosity, some hundred or more flung themselves upon it until it resembled the Calcutta—Chittagong Express. Fifteen minutes of frenzied chuffing and we arrived at the end of the line, clearly marked by a fallen tunnel, some 9,000 feet above sea-level.

Then began a fearful race. We were told by Roger that the Goûter Hut, for which we were making, would only hold a certain number, and that twice that number were with us. We must therefore be in the first fifty to reach it. It says a lot for the fitness of our party that, in spite of lunch at the Tête Rousse Hut (11,000 feet), we were the first to reach the Goûter (13,000 feet) and we did it in under the four hours, heavily laden though we were. But all this hurry availed us little. True we were assured a place for the night and, true, numbers were turned away; but our share of the hut turned out to be very small. The Goûter Hut is about 30 feet by 15 feet, and much of it is taken up by two bunks, 6 feet by 20 feet each, one above the other. In each of these, twenty-five people spent the night, while a further forty lay on the floors: I do not suggest that they slept, for sleep is hardly possible when the share of the bed is about nine inches per person, and no one can turn, even if everyone turns together.

The start the next morning was late, as we had to wait for daylight to collect our belongings. It was a steady trudge to the summit, where a cold wind whipped snow powder in our faces, and at 14,000 feet we came out of the clouds, where the view was superb. At 16,000 feet some members suffered a little from the altitude, but nearly everyone struggled to the top. It is a great pity that the ascent of the highest mountain in the Alps has become a matter of such commonplace. The descent was far more enjoyable, being undertaken at great speed. In fact, we made the 11,000 feet to Chamonix in five hours, causing great amusement to the French by having a race with a funicular on the way.

So came to a happy conclusion another Alpine meet—not one in which great climbing was done but one in which several people who would not have done so otherwise got their first view of the Alps at close hand—a meet that was brought to safe conclusion in the most dangerous and fatal season the Alps have yet known.

NOTICE

W. H. Tilman, D.S.O., M.C., the leader of the last Mount Everest expedition in 1938, has accepted an invitation to become Vice-President of the R.A.F. Mountaineering Association.

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THE AIR FORCE IN BEING

By Flight Lieutenant G. W. W. Waddington, D.F.C.

Is there such a thing as an air force in being which compares favourably with the naval equivalent of a fleet in being? This interesting question was the subject of a very heated argument between several of my friends and myself as we pursued a course of studies for promotion examination "C," and we never arrived at a really satisfactory conclusion. In common with most air situations, it is difficult to lay down hard-and-fast rules, and it is generally accepted between the three Services that while the Army and Navy can produce reliable estimates of opposing strength the best the airman can do is to hazard a guess.

A paragraph dealing with the air force in being appears in a pamphlet issued by the Directorate of Command and Staff Training in February, 1949, entitled "The Part of the R.A.F. in National Strategy." It says this: "The soldier can man a perimeter or a series of defended areas and can be certain that as long as he is undefeated everyone and everything behind him is safe from attack from the enemy land forces. The Army forms a physical barrier on the ground against the intruder. In a similar way, the Navy blockading the enemy ports constitutes a barrier against the enemy fleet, and merely by the threat of its existence the Navy provides security for our sea communications. Land and sea forces can provide this protection because they lay, rest and feed in the same element as that in which they fight. They are effective when they just sit and wait. But in this respect air forces are at a great disadvantage because they do not live, rest and feed in the element in which they fight, and because they have to burn the fuel they carry in order to stay in the air. For this reason they can never maintain a permanent barrier in the air and an air force on the ground does not constitute the same threat as a fleet in being. In fact, an air force on the ground is a liability."

Lord Tedder, in his book *Air Power in War,* has this to say about an air force in being: "One of the standard principles in naval strategy has been what is called the 'fleet in being'—the fact that all sea movements in a given area are affected by the presence of a strong naval force in that area, and that that influence persists so long as that force is present as a potential threat, even though it may never be engaged. There is no similar war-time principle applicable to air forces. An air force order of battle is in itself no firm criterion of its true strength, since there are many imponderable factors which only show themselves in action; an air force can only be judged when put to the test of action, and consequently it is unlikely to be taken at its face value if it remains inactive. In war time an air force in being is not likely to be a power in the land."

These two extracts form the basis of the argument against the theory of an air force in being and the qualifications of the writers increase its potency. The first point which strikes me about the paragraph from the Air Ministry pamphlet is that it considers all three Services separately, but modern war demands that all operations must be related to and supported by the other Services. Thus the Navy depends upon the Air Force in order to apply the threat of a fleet in being. The Army depends on both the Navy and the Air Force in order to apply its threat of an army in being. Surely the Air Force, if it is assured of a secure base and sea communications, must also be capable of exerting a considerable force as an air force in being? The pamphlet says that an air force on the ground is a liability. Agreed, but in these days so is a fleet in harbour or, for that matter, anywhere where enemy air power is operative, and we all know how handicapped

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any army can be without efficient air support. An air force can be mobilized and be in action against the enemy in a matter of hours, and, provided that it is equipped with a wide network of radar-warning devices, this danger of being caught on the ground can be nullified.

There remains now the question of the third dimension. The Army and Navy live, rest and feed in the same element as that in which they fight, and because air forces do not do so and have to burn the fuel they carry in order to stay in the air they cannot maintain a permanent barrier in the air. Is this statement true? In times of peace, when air forces are of necessity small, I suppose we must agree, but in doing so it is as well to point out that even naval units can run out of fuel, and in these days of mechanization what good are tanks if they outstrip their fuel supplies, as they often did in the race across France and Germany in the last war? No one will doubt that towards the end of the last war we did maintain a permanent barrier in the air both offensive and defensive. Our round-the-clock bombing policy and effective fighter defence ogranization, plus the fact that air superiority was fought for and won over German territory, are proof enough. So it would seem that where supremacy in the air exists, as near a permanent barrier as is possible can be maintained—certainly protection as good as that afforded by navies and armies in being can be provided.

It is stated that land and sea forces are effective when they just sit and wait, but in modern war is this the correct approach? Our fleet in being did not deter German raiders from operating most efficiently in the North and Atlantic Seas. In fact, the more one thinks about it the more the boot seems to be on the other foot. With regard to the German naval ships at Brest the Navy had large units tied down in a cat-and-mouse game, and even then they did not prevent their repair and escape. The Army, too, cannot claim it is effective when it just sits and waits. If anything has a disastrous effect on morale it is doing nothing; in addition, the enemy is provided with a breathing space in which to rest, reorganize and re-equip. This sitting-and-waiting value would seem to be null and void when examined in the light of the last war. It is something which necessitates a neutral or defensive attitude—it is the offensive spirit which wins wars and this applies to all Services.

It may be as well to point out here that the threat of the air force in being in the last war caused Germany to turn almost the whole of her aircraft industry over to the production of fighters. What better results could one expect than this —the enormous importance of making the enemy commit himself to the defensive, thus gaining for our home base freedom from scathing bomber attacks, to say nothing of the vast numbers of personnel who were tied down in a huge static defence organization and not available for operations elsewhere?

Lord Tedder states that an air force can only be judged when put to the test of action. Surely a logical conclusion which one can draw from this is that if it comes through that test successfully it is a power, and quite a considerable power, to be reckoned with. I think that in the phrase "if it comes through the test successfully" we have the crux of the argument. When applied to armies and navies this qualification of being put through the test of action is not of such great importance because their weapons and uses in war are relatively slow to change, and in addition they have been well tried out over long years of warfare. But it is of tremendous importance in air warfare where everything is relatively new and untried, tactics are largely a matter of day-to-day experience, and aircraft are suitable to modifications which may give them tactical advantages. Once the test has been passed and a lead is kept in new developments, cannot we

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KNOW YOUR ALLY!

THE NETHERLANDS ARMY AIR FORCE

By Squadron Leader H. R. Allen, D.F.C.

THE war ravaged Holland's economy and split its Air Force into fragments. The Dutch are doggedly working towards economic recovery and in large part succeeding: petrol, milk, eggs and butter are unrationed, together with many other commodities, and meat is likely to be unrationed when this article comes into print. The standard of living in Holland is probably higher than in England, and industrial disputes are rare.

In the same spirit the Dutch are working towards the rebuilding of their Air Force. When liberation came there was no Air Force. Now they have behind them a record of achievement for which they can feel justifiable pride.

This by no means implies that they are content to rest on their laurels. They are determined to play to the full their part in the defence of Western Europe. The four winds have their traditional policy of neutrality.

SITUATION AT THE END OF THE WAR

On the credit side there were several airfields which had been either built or enlarged by the Germans. Most of these had suffered heavy bombing at one time or another, however, and few retained permanent buildings of the sort necessary in peace.

The only aircraft available were those of No. 320 (Dutch) Squadron, which had operated from England during the war; these were Mitchells.

The personnel situation was bad. A few officers and men had managed to escape from occupied Holland and had seen war service with the R.A.F., or the R.A.A.F., or the U.S.A.A.F. But these were not many or of very exalted rank.

On the debit side, the majority of regular officers had been taken prisoner by the Germans and had missed, therefore, the experience and developments of the war; in this category were included most of the higher-ranking officers.

There was little money available for rebuilding the Air Force—or, for that matter, the Army and the Navy—and the metropolitan forces were further hamstrung financially by the need to base forces in the Netherlands East Indies, where insurgent republicans were causing trouble.

On top of all this, it must be remembered that the pre-war Air Force in Holland was very small and by no means modern. Much would have to be learned about operating fast, modern fighters and controlling them scientifically and accurately from the ground.

Finally, the Dutch are very influenced by tradition. The Navy was traditional in Holland, and, therefore, popular. So, to a lesser extent, was the Army. The Air Force carried no tradition—it had fought in no wars or even campaigns, apart from a brief resistance to the invading Germans in 1940. The struggle for recognition—especially financial recognition—was likely to prove grim.

The size of the tasks to be undertaken needs no further elaboration.

POST-WAR PLANNING

What sort of Air Force? How organized? What equipment? Where based? These were but a few of the questions. But the undercurrent running through all

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deliberations was the simple, if monotonous, theme: where was the money to come from?

The Royal Air Force took a long view at this juncture. It sent out a mission to Holland with the double brief of clearing up problems caused by the temporary occupation of R.A.F. units during the period of the liberation, and of assisting in any way possible the rehabilitation of the N.A.A.F.

Dutch pilots and other aircrew continued to pass through the training machine of the R.A.F. even though the war was finished. A Dutch Technical Training Establishment was formed at R.A.F. Station, Langham, where ground tradesmen were given skilled instruction. The sale of R.A.F. equipment was authorized to the N.A.A.F. and assistance given in a hundred and one other ways—including the opening of our Staff College to senior Dutch officers. This policy, formulated long before the need for the Brussels Treaty and the Atlantic Pact could have been foreseen, is now likely to bear precious fruit.

For the Dutch authorities, manning was a prime consideration; this was solved—sufficiently for short-term requirements, at least—by continuing conscription and allowing likely candidates reserve commissions.

Flying training schools equipped with Tiger Moth and Harvard aircraft were set up at N.A.A.F. Stations Woensdrecht and Gilze Rijen respectively. In due course, Spitfire aircraft were purchased and an operational training unit established at Twenthe—on the border with Germany; the first task of this unit was to train a squadron of fighter pilots for the Netherlands East Indies, but subsequent output from the school was reserved for the metropolitan force.

Lieutenant-General Giebel, Chief of the Netherlands Army Air Force

The next step was to rebuild a suitable station whither the technical training school could be moved; it could not be allowed to stay at Langham for ever. N.A.A.F. Station, Deelen, was selected and the move took place smoothly. The procedure there is still based upon R.A.F. pattern.

The need for a radar network soon became apparent and plans were drawn up to provide for this.

During this period of long-term planning the N.A.A.F. authorities began to realize that advice from R.A.F. specialists was necessary. Many of their war-experienced officers who had joined only for the duration of hostilities had by now left the Service, which meant that there was a shortage of experience in several departments. True, the R.A.F. Mission had been an advisory body, but when one of its tasks was complete—that of clearing up the mess left by the liberating R.A.F.—it was felt that closer liaison than that provided by the mission would be

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Major-General Aler, N.A.A.F. representative to the Military Committee of Western Union

advantageous. The N. A. A. F. asked the Air Ministry for a few R.A.F. officers to be provided for advisory duties. This request was agreed and six officers were appointed at the beginning of 1947. Of these, two were officers of the General Duties Branch and the remaining four held commissions in other branches. The appointments were as advisers for Air, Organization, Equipment, Signals, Engineer and Technical Training. Apart from the advice that these officers were able to give from their own experience, they were useful in providing liaison and direct channels of communication with Air Ministry departments.

HIGHER ORGANIZATION

A brief *raconté* of the higher organization of the N.A.A.F. might be of value here:

The Minister of Defence is responsible to the Cabinet for the three Services. Under him there are Secretaries for the Marine (Navy) and for War (Army and Air Force). The Air Force relies for political representation, therefore, upon one man who is also the political representative for the Army.

On paper the C.A.S. has equal standing to the Chief of the (Army) General Staff. In practice, however, the Army Council is allowed certain say in the formulation of Air Force policy. Further, the (Army) Adjutant-General is responsible for allotting conscripted personnel to both Army and Air Force, and the (Army) Quartermaster-General is responsible for handling non-technical stores for the Air Force as well as the Army. Whilst the Air Force is free to work out its policy to a large extent, therefore, the Army still retains certain control over it. In fact, the Air Force can by no means be regarded as "independent"—or, if preferred, "centralized"; and there will be resistance from several quarters before this ideal is realized.

The Chief of the N.A.A.F. is Lieutenant-General Giebel, who was recently promoted to that rank. He was taken prisoner by the Germans in 1940, but managed to escape to freedom. He finished the war on the staff of General MacArthur in the Pacific theatre.

Next comes Major-General Aler, who, until a few months ago, was Commander-in-Chief of the Metropolitan Air Force. He now holds the appointment of N.A.A.F. representative in London for the Western Union Military Organization. Before leaving Holland for London he was awarded the Order of the Orange Nassau for his work in rehabilitating the N.A.A.F. He was one of the two founders of the now-famous K.L.M. air line.

Major-General Baretta followed General Aler as Commander-in-Chief of the Metropolitan Air Force. He was considered an outstanding officer whilst serving on the General Staff and was previously Chief of Staff to General Giebel. He is a

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TABLE OF RATIONALISATION OF STANDARDS OF FLYING QUALIFICATIONS

Civil Licence	*Proposed R.A.F. Grading*	*Common requirements for the grant and renewal of Licence/Grading*		*Additional qualifications for the grant of Civil Licences*	*Additional qualifications for the grant of R.A.F. Grading*
		Flying Hours	*Technical*		
Private Pilot	Junior Pilot	25 dual 15 solo *Renewal* 5 hours during past year	Aviation Law Elementary Met. Map Reading Compasses Operation and Functioning of Flying Machines	Civil Aviation Law and Procedure	R.A.F. Aviation Regulations and Procedure
Commercial Pilot	Service Pilot	150 hours	The following requirements graded according to Licence or Grading:— Aviation Law Flight Operation Air Navigation Meteorology Theory of Flight Operating Limitations Aircraft Equipment and installations Aircraft Maintenance *Renewal*: Reasonable flying experience within past 6 months	Examinations and/or tests graded according to Licence required:— Civil Aviation Law and Procedures Civil Aviation Documentation Passenger Handling Civil Aviation Organization Civil Navigation Practices Generally, matters peculiar to the duties of a civil pilot	Examinations and/or tests graded according to status required:— R.A.F. Aviation Regulations and procedures R.A.F. Discipline and Administration R.A.F. Organization Bombing, Firing and Aerial Photography as appropriate Weapons Tactics, including Tactical Navigation Generally, matters peculiar to the duties of an R.A.F. pilot
Senior Commercial Pilot	Senior Service Pilot	700 hours			
Airline Transport Pilot	Operational Pilot	1,200 hours			
Master Pilot	Command Pilot	5,000 hours without culpable accident	Have held the A.L.T. Pilot's Licence/Op. Pilot Grading, for 5 years. *Renewal* to depend on the continued renewal of any Licence/Grade	To be highly qualified in all appropriate aspects of Civil Aviation	To be highly qualified in all appropriate aspects of R.A.F. Aviation

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THE QUALIFICATIONS OF R.A.F. AND CIVILIAN PILOTS

By *Squadron Leader* D. Martin Butcher, O.B.E., F.R.Met.S., A.R.Ae.S.

THE Air Ministry has recently announced that the annual medical examination for general duties officers—in abeyance for ten years—is shortly to be reintroduced. This announcement implies recognition of the fact that medical fitness for flying might deteriorate, and that a check is necessary at regular intervals.

It has been conceded that medical fitness may require periodic checking: what of flying aptitude and qualifications?

Qualifications for the award of the flying badge ("wings") and as "service pilot" on completion of training are not published by the Air Ministry and, although no definite requirements are laid down, it can be assumed that the R.A.F. training organization turns out a sound, all-round R.A.F. pilot. Once he has passed from training, however, it would appear desirable to ensure that not only is there no deterioration in the R.A.F. pilot's medical fitness but also that he is up to date in the many aspects of the ever-developing field of aviation. This might be achieved either by a periodic check on knowledge, by examination and/or practical test, or by adopting the method used in the renewal of civil flying licences.

The qualifications required for the issue of civil flying licences are contained in Section XIII of the Air Navigation (General) Regulations, 1949. In the paragraph on renewal applicable to each class of licence it is laid down that the licence holder may be required to undergo any or all of the practical flying tests or examinations before the licence will be renewed. If the licence holder is not in current flying practice, or if there has been a considerable change in the regulations or procedures since the applicant was last examined, he can be called upon to prove his aptitude in those particular matters.

By making the R.A.F. pilot's qualification conditional on regular renewal, and renewal conditional on test or examination if considered necessary, all pilots would have to maintain a high standard of knowledge and practice in order to retain their flying qualification.

Examination of the qualifications required for R.A.F. and civil pilots shows that there is a broad similarity between the two. Both include the fundamentals of aviation and navigation, whilst R.A.F. requirements have certain additional subjects of value only to Service operations, and civil requirements have similar additional civil subjects. It should be possible to reach a measure of agreement on the basic aviation qualifications required in Service and civil aviation, and to make a direct comparison between the two.

Consideration of the syllabus of the R.A.F. Flying Training School indicates that the purely aviation qualifications required approximate to those laid down in the Air Navigation (General) Regulations, 1949, for the grant of the commercial pilot's licence. By slight adjustment to both sets of requirements they could be made identical in the basic subjects.

Civil licences of higher standard (e.g., the airline transport pilot's licence) have no corresponding standards in the R.A.F. Highly qualified R.A.F. pilots may have exceptional qualifications as a result of private study or the taking of, for example, the staff navigator's course, and they may have achieved a standard

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similar to that required in the airline transport pilot's licence, but their R.A.F. pilot classification remains the same.

In order to encourage R.A.F. pilots to obtain higher standards of qualification, it would be desirable to introduce a system of grading. Once again, the basic aviation subjects could be made common to standards of both R.A.F. and civil aviation. A suggested rationalization of standards is shown in the table.

Under this system the R.A.F. pilot would pass from elementary training as a junior pilot, and from his final stage of training as a Service pilot. Subsequent grading would depend on flying experience and examination, from which some measure of exemption might be afforded to those who had successfully completed a course, e.g., in navigation.

To bring the procedure for the renewal of R.A.F. gradings into line with that of civil licensing, the grading would require to be renewable every six months, and renewal would have to depend on the successful completion of a medical examination as well as proof of flying experience during the preceding six months, and re-examination where considered necessary.

Since the R.A.F. pilot's "licence" is worn on his uniform, whereas his civilian counterpart carries his licence in his pocket, it would be necessary to introduce graded wings in order to indicate the degree of qualification of the pilot concerned. A step in this direction has already been made by the introduction of special wings for National Service entrants who undergo elementary pilot training, and wing designs for higher grades might well benefit by an examination of the American practice in this respect. As an added incentive, and following the established civil practice that additional qualification results in additional remuneration, "pilot qualification pay" might be introduced for the various degrees of qualification—a small payment of perhaps sixpence per day additional for each step in qualification. The R.A.F. pilot would thus be encouraged to attain the higher standards and, once attained, to maintain them on penalty of losing his distinguishing badge and additional qualification pay.

Having integrated the required R.A.F. and civil qualifications, grant of licences, or pilot grading, in either Service to members of the other Service would, by agreement between the Air Ministry and the Ministry of Civil Aviation, be conditional only on the passing of examinations or tests in additional subjects appropriate to the Service in which the qualification is desired. Thus, an R.A.F. pilot leaving the Service with category "senior Service pilot" would be granted a senior commercial pilot's licence on passing examinations in the subjects peculiar to civil aviation, and the Ministry of Civil Aviation would know that he was up to the standard in the agreed basic subjects.

In time of transition from peace to war it would be invaluable to be able to classify civil pilots immediately in terms of R.A.F. requirements. Thus, the commercial pilot's licence would ensure the grant of the Service pilot's badge on the successful completion of a short course in administration, discipline, organization and operational flying.

Once such a scheme had settled down it should be possible to relate R.A.F. posts to pilot qualification. For instance, the minimum standard required of a bomber squadron commander might be that of operational pilot, and his flight commanders might be required to be senior Service pilots. Such gradation would do away with the need for promotion examinations in aviation subjects for general duties officer pilots, as promotion would then be subject to the attainment of a pilot qualification appropriate to the higher rank.

The scheme outlined would require modification in the case of fighter pilots,

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ADMINISTRATION IN THE ROYAL AIR FORCE

By Air Vice-Marshal W. M. Yool, C.B., C.B.E., *p.s.a.*

FIRST of all, what is administration? The term as used in the British Army and Royal Air Force has a much wider meaning than the term "logistics," used in the American forces, which relates in the main to the supply and movement of forces in the field, whereas administration includes not only these aspects but covers also all aspects relating to personnel, and everything relating to the organization and backing of the force.

In the early days of the Royal Air Force there is no doubt that the standard of administration fell much below that of the Army, largely because of lack of interest by the general duties officers of those days, who formed the great majority of the Force, in the subject. In the Army, on the other hand, it had long been realized that the efficiency of the Service was largely dependent on sound administration, and that it could not fight effectively unless it was supported by a reliable system for its supply and movement, the principles of which were well understood by all.

This need had been brought home to the Army as the result of experience, and by the fact that the administrative units, particularly in a war of movement, were intimately bound up with the fighting units, and had themselves frequently to take part in the fighting. This had led to the development of what might almost be called a standardized system of administration, and which was admirably set out in the relevant parts of Field Service Regulations.

The fact that a sound administrative system was equally necessary for the Air Force was not at first obvious, because the administrative units are usually divorced from the fighting units, and even in the latter it is only the crews of the aircraft who normally come into contact with the enemy. This inevitably tended to engender in the general duties officer a sense of superiority over his fellows, and the feeling that the mundane business of administration was not his concern. Nor was there much to be learnt from the history of the 1914-18 war. The static nature of the campaign, together with the comparatively small size of the air forces engaged, even at the end of the war, meant that few administrative lessons emerged.

Fortunately, however, there were a number of far-sighted officers who fully realized the importance of the matter, and who made a special study of the subject. As a result, a sound system of administration had been evolved by the early 1930's, which was embodied in various manuals, and which eventually stood the test of war.

At the same time, increasing attention was focused on administration in the Air Force in general, and at the Staff College in particular, so that by the time war came in 1939 knowledge of the subject had been widely disseminated. There was thus a considerable body of officers available with a thorough grasp of the essentials of the administrative system and the administrative problems likely to arise.

As the majority of these officers were in the General Duties Branch, however, most of them had inevitably to be employed in operational appointments,

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particularly in the early stages of the war, when they were the only officers available with such qualifications. Their places were largely filled by non-Regular officers, and thus when the war ended the Air Force was once more faced with the necessity of educating the general duties officer in the principles of administration, as the more junior ranks are necessarily filled with a new generation of officers who had been employed during the war almost entirely in operational posts.

Owing to the increasing complexity of the Royal Air Force probably some seventy-five per cent. of the officers have to be employed on administrative duties, using the term in its wider sense and including the Technical Branch as a part of the administrative machine. This means that many general duties officers have to be employed in administrative posts, and they are thus learning the hard facts of administration in the best school of all, practical experience. There is thus little danger of the subject falling again into the state of neglect which characterized it during the early days of the Air Force.

But there is now the danger that the administrative tail may become too powerful, and attempt to wag the operational dog. This is a fear which is frequently expressed, and there is undoubtedly something in it, as the administrator is inclined to forget that administration is only a means and not an end. It is important therefore for him always to keep firmly fixed in his mind the fact that the Air Force exists only to put aircraft into the air, and frequently to ask himself whether the particular step he is proposing to take will assist in that purpose.

Because of the fact that the whole of the Air Force exists only to put a small spearhead of fighting troops, namely, the crews of the aircraft, into the air in their aircraft, and because there is little need for the aircrews to concern themselves with the vast administrative processes necessary for this there is always a tendency in the Air Force for administration to be divorced from operations. The more efficient the administration the more this is likely to happen, as the operational element will tend to take the administrative backing for granted. Only when things go wrong, and operations are hampered, does the existence of the administrative staff become evident.

And what is the secret of good administration? There is no black magic about it. The main qualities required of an administrator, as for most things, are plenty of common sense, determination to keep his eye on the ball, i.e., his job of getting aircraft into the air, a tidy mind, a good memory (no filing system ever invented will enable him to keep the multifarious details he must remember at his finger-tips), the ability to switch his mind rapidly from one subject to another without getting confused, and a capacity for organizing all the many aspects of administration into one co-ordinated whole. At the same time, he must be able to decentralize, in order to avoid becoming submerged in detail to the exclusion of the wider aspects of administration.

The work of the administrator can therefore be likened to that of a housemaid sweeping a room, whose aim should be to keep the dust more or less in a straight line as she sweeps. Similarly the administrator must ensure that all the requirements of the force progress evenly so that everything required is available at the right time and place. It is of no use, for example, to produce aircraft if the airfields for them are not also ready, or if the aircrews to man them have not been trained.

This in turn means that the administrator has not only to deal with the day-to-day problems of administration, but he must at the same time always be looking ahead, and foreseeing requirements before they arise. His constant endeavour

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should be to be a jump ahead of the operational staff. An administrative planning staff is therefore an essential part of the administrative set-up at Air Ministry and Command level, and allied to this is the need for a statistical staff to provide the necessary data on which provisioning, whether of men or materials, has to be based.

The sort of information which the administrator requires to have constantly before him, and which might therefore be described as the vital statistics of administration, includes particulars of the present and future order of battle of the force, on which the provisioning of aircraft, the recruitment and training of personnel, and the number and location of the airfields are based. He also requires details of the personnel establishment together with the strength actually available, a list of the works services in progress, and the amount of money allocated for works services during the current financial year. The latter figure is, in fact, a convenient means of indicating the labour and material available for works services.

His forward planning can then be based on this information, and on his knowledge of the future operational commitments of the force, so that requirements can be foreseen and planned before they arise. As, however, there are never enough men and materials to meet all requirements, particularly in peace time, the administrator will find himself frequently being called upon to advise the operational staff as to what is practicable and what is not. This is, in fact, one of the most important of his duties, and he will find himself constantly having to weigh up and decide upon various conflicting claims for the resources which are available.

It can be seen therefore that good administration is fundamental to the efficiency of the Air Force, and it is important that all general duties officers, even if not employed in administrative posts, should have a sound knowledge of the principles of administration, as only thus can they appreciate the limitations which administrative factors may place upon operations.

To sum up, the art of administration lies not only in seeing that the day-to-day needs of the Force are met but in constantly looking forward and ensuring that all likely eventualities, within the limitations of the resources available, are provided for. At the same time, the administrator should always bear in mind the aim, namely, to get the aircraft into the air, and the more efficient is the administration the less is the operational staff likely to realize this. In other words, the administrator must look for his reward in the absence of blame or complaint because of administrative shortcomings, rather than in praise because things have gone well.

EDITOR'S CHANGE OF ADDRESS

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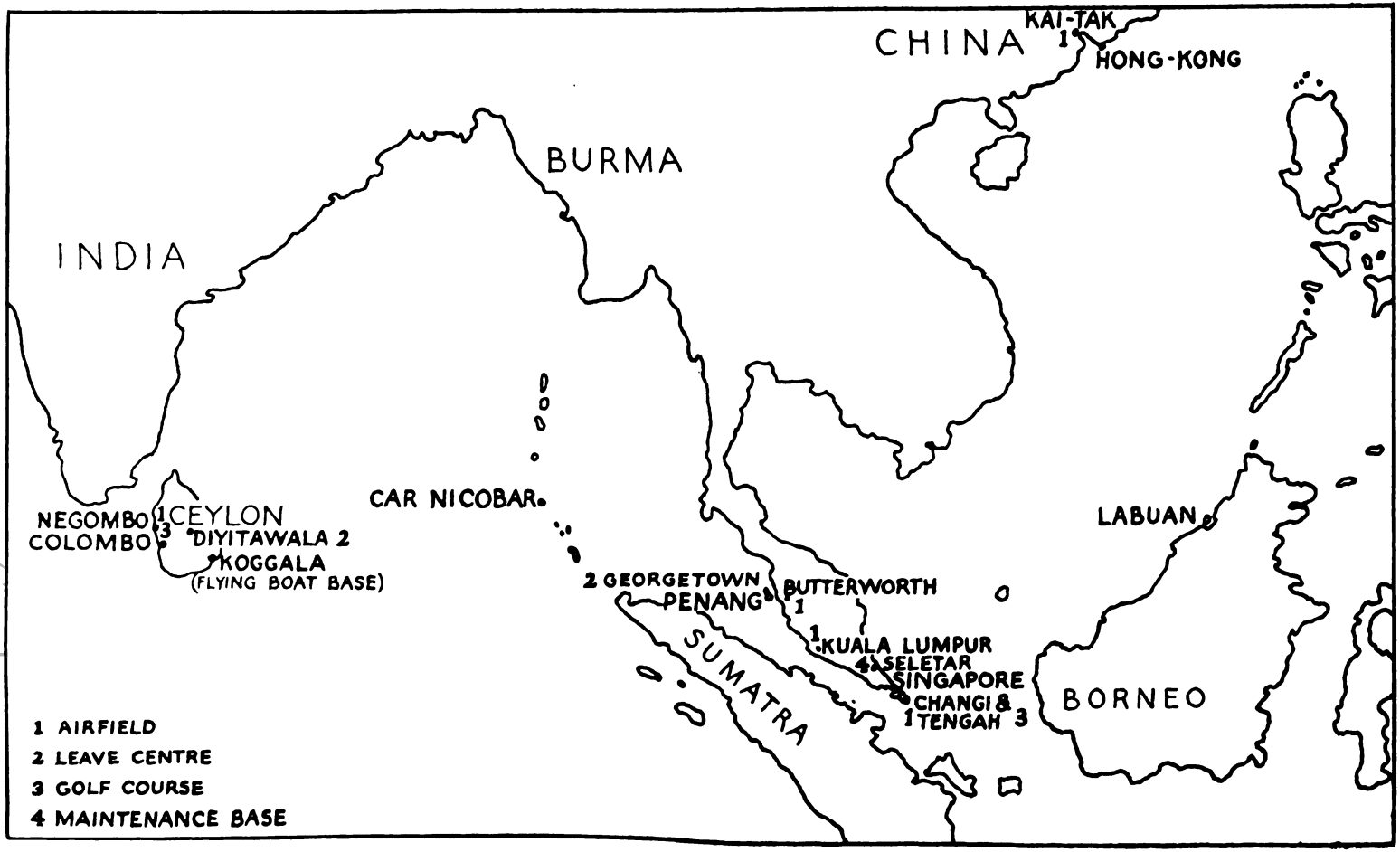

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LIFE WITH THE FAR EAST AIR FORCE

"WHAT is it like on an Air Force station in the Far East?" This question is undoubtedly in the minds of those who are about to proceed there, and possibly also those awaiting a posting "somewhere overseas."

Many may have friends who have recently returned from a Far East station, but the information they can give may be limited to one station only and the Command comprises many stations scattered over a wide area.

It therefore might be of interest to many if a more comprehensive picture of the Far East Command and an outline of the general conditions were given.

Even in home commands some stations are better than others; it is the same anywhere overseas, but there are advantages of foreign tours that are sometimes forgotten.

The novelty of it all, the opportunity of broadening the mind by travel (far beyond the financial reach of most), the comradeships formed by sharing with others the excitement of travel, the varying conditions, and the adventures and sightseeing; so forming a circle of new friends that endures for years afterwards.

On return there is the "line" that can be shot to "parochial" friends and relations and that photograph album that can be produced, with a story attached to every picture.

Are you going to enjoy it? That is entirely up to you. Everyone's circumstances are not the same and in some instances there are "ifs," which arise even in postings in the United Kingdom. If you are going to spend the time pining for some girl friend (or boy friend in the case of the W.R.A.F.) that you have left behind, or you are married and will constantly worry if your wife does not accompany you, then you will be at a disadvantage compared with those without these troubles. Nevertheless, even in such serious cases, the many distractions and intensely interesting life will cause even the most lugubrious to have long periods of relief from their anxieties. For others there are no possible reasons why they should not enjoy themselves.

STATIONS IN THE FAR EAST

The Far East Air Force includes all R.A.F. stations and units from Ceylon to Hong Kong. These vary greatly both in size and character. There are the big airfields at Negombo, in Ceylon, twenty-five miles north of Colombo, Changi and Tengah on the island of Singapore, and of Kai-Tak on the Chinese mainland opposite the island of Hong Kong. Among the smaller stations are Koggala, the flying-boat base in South-East Ceylon, Butterworth on the West Malayan mainland looking out on to Penang Island, Kuala Lumpur (the federal capital in Central Malaya and the base for the squadrons operating against the Communist bandits) and Sembawang in North Singapore. There is the large R.A.F. Maintenance Base (Far East), Seletar, fifteen miles north-east of Singapore, which is the source of supply for the needs of the R.A.F. in South-East Asia. Lastly there are a number of smaller units like the signals centres, links in the world-wide R.A.F. communications chain, in Ceylon, Singapore and Hong Kong, with detachments at islands like Labuan off the coast of British North Borneo and Car Nicobar in the Indian Ocean, where there has been installed navigational aid equipment for the use of Service aircraft flying between Ceylon and Malaya.

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THE CLIMATE AND ACCOMMODATION

Generally speaking, an airman's day, as regards his work and working hours, does not differ much from what he experienced at home, except of course that khaki shirt and shorts instead of blue are the dress of the day; where physical exertion out of doors is necessary shorts only are generally worn.

The climate in Ceylon and Malaya is tropical and, being close to the Equator, remains equable and warm throughout the year, but in Hong Kong there are greater extremes. From November to March it is sufficiently cold to welcome fires and R.A.F. "blues," which for the remaining part of the year are replaced by fans and khaki drill.

Accommodation is of several kinds. At the pre-war permanent stations, as in Singapore and Hong Kong, large, airy barrack blocks with broad verandas exist, specially designed to give the maximum of comfort. Both at Seletar and Changi several blocks of this type have been allocated to the W.R.A.F.

In Ceylon war-time wooden buildings are still in use. These have now been brought up to peace-time standards of living.

In Malaya airmen are living in huts with dried palm-leaf (attap) roofs, which, while appearing pleasing to the eye, also keep the interior cool from the heat of the sun and dry from heavy showers of rain. These will be replaced with normal barrack accommodation in the future.

A feature of the accommodation is that throughout the Command every airman has or will have in the near future his own special bedside compactum. This consists of a slatted wardrobe through which air can easily pass so that his uniform and civilian clothes may keep dry, and a smaller cupboard for his personal possessions, on top of which is a writing slide.

Menus are much the same as at home, although there is always fruit in abundance, such as pineapples, bananas and papayas from Malaya, and apples and oranges from Australia.

Married accommodation is provided at the majority of stations. The large numbers of married quarters at permanent stations which had to be used for other purposes during and immediately after the war as messes, offices and the like, have now been given back to airmen's families. At other stations new quarters have been built or provided by converting other buildings no longer required for their original purpose. Substantial progress has been made in the plan to provide married quarters to the full scale and it is hoped to obtain funds to build a further 150 airmen's married quarters this year. A common roster for married quarters based on a points system is maintained and when an airman comes to the top of the roster he is posted to and allocated a quarter at another station if he cannot be given one at his existing station.

At a number of units there are youth clubs, Scouts, Guides, Cubs and Brownies for the benefit of airmen's families. An S.S.A.F.A. nurse visits units to advise families and runs baby clinics. There are also a number of married families' clubs in the Command.

LEISURE OCCUPATION

But it is in their leisure moments that the airmen and airwomen in the Far East are more fortunately placed than their comrades at home. For with a long succession of days of sunshine and cloudless blue skies marred only at intervals by heavy monsoon rain or short and sharp tropical storms, there are unrivalled opportunities for sport of all kinds all the year round. There are similar opportunities for bathing, and, unlike swimming in the United Kingdom, there is no

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fear of a shock to the nervous system on entering the water. In fact, occasionally there is a wish that the water was a little colder.

R.A.F. stations in the Command are well provided as regards playing fields and there is every facility for all to join in games, football, rugger, cricket, tennis, hockey and netball, the last-mentioned being particularly popular with the W.R.A.F. The majority of stations also have adequate bathing pools. At Koggala the pool is cut out of coral, which acts as a barrier to the rolling breakers of the Indian Ocean. At Changi the airmen and airwomen have a large bathing lagoon beside the Straits of Johore. At Negombo and Kai-Tak pools are now under construction.

One favourite sport throughout the Command is yacht racing. In all the larger stations there are flourishing clubs where officers and airmen and airwomen have an equal share in the management. It is surprising how many newcomers arrive in the Far East with little or no knowledge of how to handle a craft and by the middle of their tour are sufficiently competent helmsmen to win prizes in local regattas.

There are also two all ranks' golf courses in the Command—at Changi and Negombo. Both are proving extremely popular with an ever-increasing membership. For those not possessing clubs, sets can be hired for a nominal cost. The cost of membership is also small.

Perhaps the importance that is placed on sport in the Command can best be indicated by a small account of Command Week, which was held in Singapore in the first week of April. Here in the finals met the four best teams from Hong Kong, Ceylon, Seletar and Malaya, each limited to thirty personnel, from whom had to be found teams for soccer, seven-a-side rugger, cricket, tennis, hockey and rifle shooting. This contest demanded a high standard of versatility from each member of the teams. The prize, the Lloyd Trophy, was won by Technical Wing of the R.A.F. Maintenance Base. (For a more detailed account, see the October number of THE ROYAL AIR FORCE QUARTERLY.)

Hobbies are not neglected. At nearly all stations there are camera clubs with large and enthusiastic memberships who take full advantage of the wealth of subjects around them. Aero modelling at Butterworth, Changi and Seletar has its followers. Art classes, music circles and dramatic societies flourish on many stations, as do handicraft groups. Malay classes are well attended out of working hours at all stations in Singapore and Malaya. At the Ceylon Signals Centre on the outskirts of Colombo is a group of exceptionally keen amateur radio enthusiasts who have an imposing collection of Q.S.T.

Film fans are well catered for. Each station has its own cinema where are shown the latest films with four changes a week, and on many occasions films appear on the Far Eastern R.A.F. cinema circuit before their London *premières*.

The N.A.A.F.I. is as ubiquitous and as well supported in the Far East as elsewhere and is firmly established in all its activities on the stations of the Command.

Canteens differ in their character and surroundings. At Negombo the N.A.A.F.I. lies in the shade of a grove of palm trees, while at Kai Tak at night from the canteen the occupants can see the myriad lights of Hong Kong gleam and flicker across the water. At R.A.F. Maintenance Base, Seletar, the airmen, owing to their numbers, have a choice of two canteens. There are a N.A.A.F.I., Chalet Club and a Malcom Club at Changi.

In addition to the station canteen, the N.A.A.F.I. runs Service clubs in Singapore and Hong Kong where airmen on sightseeing or shopping expeditions can call in for a meal. At Singapore there is also a Union Jack Club, where both

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airmen and airwomen can stay on leave, at prices far below the average cost of an hotel.

The N.A.A.F.I., with W.V.S. assistance, is responsible for the running of the R.A.F. Leave Centre on Penang Island, Tanjong Bungah, where eight airwomen and seventy airmen can be accommodated at any one time.

Tanjong Bungah is a large house in the centre of attractively laid-out grounds, bright with flowering shrubs and trees that sweep down to a private beach where the guests can swim and sun-bathe to their hearts' content. Close to the house badminton, table tennis, clock golf and other games can be played by the more energetic.

Picnics are frequently arranged to beauty spots on the island, and there is easy access to George Town, the port of Penang, with its modern amenities and old-world charm.

For the airmen in Ceylon there is a naval leave camp at Diyitalawa in the Central Highlands, to which they are welcomed as guests. It affords, being high up, a welcome change from the humidity of the plains below, with an absence of mosquito nets and a novel need for blankets.

Every six months the Command Institute Committee, with airmen and airwomen representatives from all stations, meets at Headquarters, Air Command, Far East, at Changi to discuss questions of N.A.A.F.I. service. This committee is fully imbued with its responsibility to all serving airmen in the Command and has a record of valuable work achieved to its credit.

In addition, a special full-time employed non-commissioned officer visits all stations in the Command to satisfy himself that adequate services are being provided.

Apart from N.A.A.F.I. facilities, social clubs connected with all denominations of the Church play a large and important part in station life throughout the Command.

Limited space prevents more than a casual mention of the system whereby under certain circumstances airmen in Malaya can visit Hong Kong and Ceylon on leave by means of indulgence passages on board troopships; of the availability of educational and fictional libraries on all stations for ardent readers; the opportunity to meet and study at close quarters the various peoples of the East and to purchase from well-stocked shops items which at home are non-existent or in short supply.

Taken all in all, R.A.F. stations in the Air Command, Far East, are well-organized, self-contained communities where the average man and woman can find plenty in their off-duty hours wherewith to occupy and amuse themselves at prices they can afford; so that on completion of their tour overseas they can return to their homes with well-tanned bodies and pleasant memories of a period in their lives, the prospect of which they once viewed with apprehension.

THE AIR FORCE IN BEING

(*Continued from page 50*)

say that the air force in being is a power to be reckoned with, even more so than that of the army in being and the fleet in being—which depends on the Air Force for its very existence?

One final point: are not the value and power of the Air Force in this respect enhanced by the production of the atomic bomb? This new weapon, when in plentiful supply, cannot fail to strengthen the power of the air force in being.

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AIR FORCES FORUM OF DISCUSSION

(Write to the R.A.F. Quarterly about it)

LETTERS TO THE EDITOR

BLACK-OUTS

SIR,

I am in full agreement with the views of B. T. Hurren, in the July publication, on "blacked-out" towns when the natives become belligerent.

Operating Hampdens (God bless 'em!), mainly in moonlight, identification of towns was made easy by searchlight concentrations and gun bursts and the reflected light of the moon. At the time, of course, the description "easy" was not a good one.

Lancasters, with radar and P.F.F., made bombing through "ten-tenths" practicable, so a black-out down below was confusing the enemy, not us. Admittedly, on occasions a lighted target might have helped, but our gain would have been less than theirs in morale, efficiency and general activity.

I am, sir,

Your obedient servant,

G. R. Ross.

"EDUCATION IN THE ROYAL AIR FORCE"

DEAR SIR,

I was interested to read Wing Commander Gordon-Finlayson's views on R.A.F. education in the October issue of the QUARTERLY, but, whilst agreeing in principle with most of his comments, I do not think we place undue emphasis on technical instruction in the R.A.F. in the light of present-day tendencies in a mechanical age.

A Service which is founded and nourished upon technical proficiency must, in the cause of its own efficiency, exact a high degree of technical training and knowledge from personnel of all branches. Any system of training for professional competence must be based on the profession itself, and in the case of the R.A.F., although very essential, academic education can only provide the basis of future technical instruction for the various specialist branches. It is manifestly impossible for a fighting Service to undertake the academic education of all its newly joined members, and although in pre-war days it was possible to insist on a minimum standard of education for recruits, that is no longer possible in these days of National Service.

Unfortunately the educational standard of Service recruits varies considerably, being chiefly dependent upon the type of school attended, home environment, and age at entry. If it were possible to insist upon a minimum academic standard the task of training in technical and professional subjects would be greatly

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simplified. Apart from university graduates, the average age of entry into the R.A.F. lies between 15½ and 19 years—probably the most impressionable and receptive period in a boy's life. At 15½ years the average boy from a good school has already had a general academic education in the broader sense and has come to appreciate the importance of self-discipline and acknowledges the necessity of observing an accepted code of behaviour towards his fellows. If he has not already had some basic education in the human qualities he is at a great disadvantage in whatever profession he enters at that age.

From the Service point of view, if the intention is to produce good officers possessing the requisite professional and technical qualifications grafted to the scion of a good academic and humanistic education, we can do no better than explore the existing R.A.F. avenues of training originally laid down by Lord Trenchard.

In my opinion, the candidate for a permanent commission should enter the Service at the age of 15½, having had a good general education up to the School Certificate standard. At this age he should enter an apprentices' training school such as Halton, where, in his first three years of service, an academic education teaches him the art of learning for himself throughout his life by imbibing broad principles on which he can found all subsequent technical and professional instruction. At the same time, he is learning the art of living with his fellow-men and learning tolerance, and understanding of the human values.

After reaching the requisite educational and technical standard he would go to an officers' training college, such as Cranwell, where he is moulded to the professional requirements of the Service and becomes versed in the principles of leadership and man management. On completion of the Cranwell course, if considered fit in all respects, he would be commissioned as a pilot officer at the age of 20 or 21.

Halton and Cranwell have been cited as examples of schools providing suitable training for the G.D. and Technical Branches, but other training schools and colleges could be founded on similar lines to cater for the requirements of the Secretarial and other branches. It cannot be denied that during the past decade the records of officers with a Cranwell and Halton background pay ample tribute to those two establishments and to the remarkable foresight of Lord Trenchard.

Yours faithfully,

E. J. PENTONO-VOAK, *Squadron Leader.*

THE QUALIFICATIONS OF R.A.F. AND CIVILIAN PILOTS

(*Continued from p. 56*)

who are generally unable to achieve a large number of flying hours and who, in any case, have no civilian counterpart. Any system of gradation would be an internal R.A.F. affair, and would probably not be acceptable to the civil authorities for the grant of commercial licences.

The introduction of this "linked-qualification" scheme would involve considerable work in the initial stages, and concessions on both sides to reach agreement on the basic qualifications required for R.A.F. and civil pilots. Once the scheme was working, however, it would do much to raise the standard of qualification of the R.A.F. pilot, and it would encourage pilots temporarily employed on ground duties to maintain themselves in flying practice. Most important of all, it would raise the professional standing of the R.A.F. to a level higher than ever before.

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THE AIR FORCES IN PARLIAMENT

AFTER the usual long summer recess (during which, however, Ministers and their departments were very active) Parliament reassembled in October to hear and to debate upon the economy measures which His Majesty's Government had promised would follow the devaluation of the pound. Our main interest centres upon the proposals for reducing expenditure on defence, and particularly upon how it will affect the Royal Air Force and other air defences.

On 24th October the Prime Minister, in the course of his exposition of the Government's policy, explained that "the structure of the Armed Forces for many years to come" would be determined by the results of the comprehensive review which the Government had set on foot earlier in the year. This, he said, was an inter-Service inquiry, conducted under the direction of the Chiefs of Staff, to establish the relative roles of the three Services under modern conditions and to ensure properly balanced forces and full value for money. The Government did not intend, therefore, to prejudice, by hasty action in the present emergency, any decision that might be taken in the future as a result of that inquiry; but certain economies had already been recommended and accepted, and most of these were now being applied. These and other savings in defence expenditure would amount to £30 million in a full year; but the Government's forecast of future defence expenditure would be announced later when their review of the future structure of the Armed Forces had been completed.

Two days later (on 26th October) the Chancellor of the Exchequer, Sir Stafford Cripps, gave a more detailed explanation of the economy cuts. In the matter of defence he repeated what the Prime Minister had said, that the Government had no intention of "making any major change in defence policy" without "full consideration of the merits of such a change." For immediate action, however, he announced:

(*a*) A substantial reduction in headquarters staffs.
(*b*) A reduction in the training, maintenance and administrative establishments.
(*c*) A more rapid run-down in uniformed man power.
(*d*) Economies in works programmes, particularly overseas, but not in those for married quarters.

It is, of course, right that the structure of the Armed Forces should be determined by the requirements of defence and should not be affected by temporary economic circumstances. And the saving of £30 million is not, apparently, to be at any great cost in efficiency. A considerable part of it had already been agreed upon as needless expense and the rest, with the possible exception of the reduction in training establishments, may be a blessing in disguise. Let us, however, take each of the Chancellor's items in turn.

(*a*) The promised reduction in headquarters staffs will be hailed with delight —by all who are not themselves members of those staffs; and even some staff officers may admit that staffs do tend to become unduly large.

(*b*) Reduction in training, maintenance and administrative establishments may be good or bad. It depends upon whether those establishments are unduly large or not. If they are, then reduction will be good and increase efficiency. Maintenance and administrative establishments, like staffs, tend to increase

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without reference to the size of the forces they serve; and this tendency to increase must be checked from time to time. But it is dangerous to have too narrow a margin; and maintenance and administrative establishments must be capable of rapid expansion in an emergency. The proposal to reduce training establishments must be viewed with some suspicion. For the training of today makes the Air Force of tomorrow; and we ought to be very sure, before we reduce our present training establishments, that we are not, for the sake of a present economy, mortgaging the future. If, however, as it appears, the proposed reduction in training establishments is to be confined to those who become unnecessary as a result of a smaller intake of recruits, then there can be no objection to it.

(*c*) A reduction in man power, too, invites serious criticism, particularly if it involves the earlier release of the more highly trained men rather than the National Service entrants. In those circumstances, the average length of service and experience of the remaining personnel will be less than it is now, and we shall be losing the very men whom we most need not only to man our defences but also to train our recruits. But it now appears that the accelerated run-down is to be effective mainly by reducing the National Service intake and keeping them for a longer period of Regular service. If that is so, then the average length of service and experience will go up. The actual acceleration in run-down was indicated by Sir Stafford Cripps when he said that there would be, on 1st April next, 20,000 men fewer than the 750,000 anticipated in the "Statement Relating to Defence, 1949"—a drop of 2.7 per cent., or one in thirty-seven.

(*d*) Cuts in works programmes, since there must apparently be cuts, may perhaps be accepted without much criticism, particularly as the programmes for married quarters will not be reduced. (These last might conceivably be expedited as a result of cuts elsewhere.) But it will be even more difficult to judge between conflicting claims for works services, especially as there is still so much leeway to make up. And it must be remembered that the efficiency of an R.A.F. squadron depends very much upon its works services: on the condition of its runway and airfield, on the comfort and convenience of its workshops, offices, living accommodation and other amenities.

While there is much to be said for the very modest cuts that it is proposed to make in the expenditure on the Armed Forces, each one of these proposals should be brought to the test of efficiency. Since the main duty of all staffs and establishments, of all man power and of all works services is to keep as many as possible of our first-line aircraft serviceable and their crews efficient; every proposal should be examined in this light and its probable effect on the efficiency of the Service assessed by experts. If a proposed reduction can be proved to be advantageous to the Service, then of course it should be made. But if it will impair the efficiency of the Service, even slightly, this loss must be carefully weighed against the economy it is hoped to achieve.

There is little likelihood that the proposed cuts in the Defence Services will involve any appreciable reduction in overseas garrisons. Mr. Eden, in the debate that followed Sir Stafford Cripps's long explanation in the House, said he did not urge the Government to cancel any of their commitments, particularly in the Far East. Least of all did he urge them to make any reduction of forces in Hong Kong. But he also hinted that much might be saved by eliminating unprofitable expenditure.

It is matter for congratulation that the rumours about the abandonment of conscription were without foundation. It would be folly to reduce the Royal Air Force by nearly fifty per cent., which the abandonment of conscription would

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involve, at a time when the international situation is as unstable as it is at present. (We have the Russian menace in Eastern Europe, an open quarrel between the U.S.S.R. and Yugoslavia in the Balkans, and a Chinese Communist force sweeping past the land frontiers of Hong Kong.) It would also be impossible to convince the Western European Powers, especially France, that we were taking the defence of Western Europe seriously if we abandoned conscription. In the present happy circumstances of "full employment" it would be impossible to man our defence forces anything like adequately by voluntary recruiting.

His Majesty's Government has, it appears, decided to modify the conditions of National Service and to call up fewer men for a longer period. This is all to the good. It will not much affect the Navy, which has but a token National Service intake; but the Army will benefit considerably, and the Royal Air Force most of all. Eighteen months' service is generally insufficient for the training of Group "A" tradesmen and aircrew, but something might be done in two years or more. A reduction in the numbers called up for National Service will present a difficult problem of selection.

To sum up, the proposed reductions in defence expenditure are welcome where they make for real economy without loss of efficiency; and they must presumably be tolerated where they threaten to impair efficiency. And there is no doubt that all concerned will see to it that efficiency is sacrificed as little as possible in the Royal Air Force.

KNOW YOUR ALLY

(*Continued from p. 53*)

graduate of the Dutch Army Staff College and successfully passed out from the R.A.F. Staff College in 1946.

The StafOfficier Luchtvaartzaken, which can be likened to S.A.S.O., Fighter Command, is Lieutenant-Kolonel van Giessen. He is a graduate of both the Dutch Army Staff College and the R.A.F. Staff College. A pilot of considerable experience, he spent over a year in Iceland before the war doing daily meteorological flights.

THE N.A.A.F. TODAY

The first Dutch fighter squadron (No. 323) was formed at the beginning of 1949. It is equipped with Meteor Mark IV aircraft and put up a very creditable performance in Exercise "Foil" this year. It is commanded by Major Flintermann, D.F.C.

No. 324 Squadron was recently formed, also equipped with Meteor IV aircraft, and more Meteor squadrons may be expected within a surprisingly short time.

Three airfields are now being used by fighter aircraft and more will be ready when required.

The network of radar stations is well on the way to completion and communications plans are in process of implementation.

All this material progress is the result of hard work and constant battles by the N.A.A.F. All the problems are by no means solved and much hard work still lies ahead.

But the N.A.A.F. can face the future with pride in what it has already accomplished, and confidence that its long-term plans will give it a sizeable and efficient force to be reckoned with.

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THE CURIOUS ADVENTURES OF AN UN-NAUTICAL GENTLEMAN

By Wing Commander H. R. P. Patterson, O.B.E., M.A.

WHEN I thought of chartering a yacht I pictured a graceful vessel having staterooms and the usual offices, floating on a perfectly smooth sea four feet deep, conveniently attached to a quay, pier or dock, and boarded by means of a solid gangway with mahogany handrails. The technique of sailing could, I felt, well be considered when I had procured the customary handbooks.

As negotiations developed, my wife—who has already braved the first twenty-five years of married life—gently suggested that the company of some nautical friends would be, on the one hand, a graceful gesture and on the other a measure of common prudence. To the suggestion of company I gladly agreed, though I was a little piqued at her estimate of my natural ability. So Roger (whose ancestors were pirates) and Leslie joined us and brought their respective wives, Jean and Thelma. My daughter and Leslie's son, Brian, came by air to witness the extent of their parents' folly.

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We converged on Calshot Castle. *Merlin* lay fifty yards off-shore. She seemed to have a very tall mast and a hull suitable for two dwarfs and a suit-case. We learned that the handing-over party were a little damp and disorganized after a rough passage round or over the Needles.

Roger went aboard: the engine spluttered weakly. A nearby R.A.F. launch growled like an infuriated mastiff, took *Merlin* on her left arm and conducted her firmly to the pontoon.

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Dropping through a small trap-door at the non-rudder (or udder) end, one finds oneself in a small, triangular cavity containing anchors, sails, chain, rope, a smell of stale shrimps and two quaint little luggage racks called pipe cots. Proceeding aft through an aperture two feet square and scraping the shins brutally on assorted junk, one enters the saloon. In this well-appointed compartment there is (in the centre) full standing room and lengthwise just lying room. Below the floorboards is a stagnant ditch called "the bilge." Handily situated on the port side is the galley and on the starboard a personal needs compartment which, by and large (but chiefly by), may be regarded as a purely ornamental feature. For an obscure reason it became known to us as "Aunt Violet." Its principal furnishment carried the insignia "Motor" and was at first mistaken for the engine. That item, however, is far more cunningly concealed under the well or cockpit, which is reached from the saloon by scaling a short, perpendicular ladder. In passing we note on either side two pigeon-holes called the quarter bunks, so named because the occupant inserts only his legs and nether portions, leaving the respiratory organs free to absorb fumes from the petrol tank or the galley according to choice of sides.

From the cockpit certain sailing operations are conducted (though many are carried out in precarious positions far removed from this position of comparative safety). In the extreme rudder end there is a hole which contains strange lamps, buckets and a lead for swinging when one is stuck on the mud or bored.

A feature of the cockpit is the bilge pump. It lies shyly concealed under a brass plate and is really a small village pump without a handle. Upon working

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the piston rod vigorously up and down there is a series of manifestations. Firstly, vulgar sucking noises, then blisters, and eventually a stream of doubtful coloured water which pours over the operator's feet into two alleged drains.

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Moments when all was calm

The Secretary of the R.A.F. Sailing Club is not, I imagine, a man who suffers fools gladly, so I confined my opening remarks to matters of a strictly non-nautical character. He recognized in Roger and Leslie men of the Nelson—Davy Jones calibre and couldn't have been more accommodating. He and Leslie had a number of conferences on the state of the compass. It looked bored and liverish. Leslie tried it at various locations, but it only seemed to pluck up real interest in the bar. I think they eventually came to the conclusion that the Isle of Wight had shifted slightly and that the compass was lacking in spirit.

. . . . . .

The ladies were soon charring as though they were still earning their usual 1s. 10d. an hour. Brian made the engine go. Leslie and Roger put on seamanlike garments and spoke in gruff terms on abstruse technical matters. I tripped over ropes and generally got in the way until the captain found the bilge pump for me. After that I never had a dull moment.

By 1800 hours we were ready for sea, which at Calshot contains an excessive number of important vessels up to the size of the *Queen Mary*. Only jellyfish, the lesser buoys and rowing-boats can be ignored. However, we sailed up and down the Solent pleasantly enough for an hour or two; I safeguarded the stability of the mast and my wife kept the vessel from leaning too far over by pushing down on the high side and saying severely to the captain: "No farther, Roger." The others did things, too, some very technical, such as catching the cooking stoves when they fell and throwing them back again. At one point something connected with the rigging was scandalized, but I never discovered the nature of the affront or how it was redeemed.

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On Sunday (or what remained of it after breakfast) we sailed towards the Needles. Brian explained the intricacies of the engine to me. The drill was simple, but for best results gorilla-like arms and a fully retractable undercarriage are necessary.

As we rounded Calshot Spit the wind freshened. Thelma held her glamour but only just contained her tummy. My wife held on firmly and gazed fixedly ahead. She was definitely allergic to gunwales under water and rapidly changed to the high or windward side as necessary. An attempt to interest her in the nautical tables failed completely. As she said beforehand, the way to enjoy sailing and avoid sea-sickness was to let oneself go with the ship. Apart from the fact that the alternative involved a considerable swim, she failed to make her demonstration convincing when we changed tacks. For this manœuvre the skipper would generally give us a little warning. Then, with a sadistic leer, he would yell: "Lee-o!" At one "Lee-o!" I hauled in in so hearty and seamanlike

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a manner that I fell on my back into the well (which was already fully infested with females), my feet lassoed in coils of rope.

I think it was at this time that we first heard of an operation or a calamity known as the "gybe." I believe we experienced it on one occasion—but very mildly: the boom merely raised a lump on my head and drew no blood at all. Arrived at our moorings, we took a tot and I pumped out the Sunday evening bilge.

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The Hamble River must be to the yachtsman what St. Andrews is to the golfer. Here sailing craft of every description lie along the river and the channel is narrow. Before we got to the bridge (since we couldn't go under it) we moored and had a leisurely lunch. Our engine started with consummate ease in the afternoon and as we were getting elegantly away and looking round for the gentleman from the *Tatler* we hit the mud. After much rocking of the boat and poling practice we were still aground. Brian was ordered by his father to mount the boom, which was then swung violently from side to side. I wondered whether walking the plank or merely a good keel-hauling would be my contribution. Eventually we came unstuck, laughing the incident off as one of those things. We were still laughing when, at the mouth of the river, Leslie put us too near the mark and we grounded good and proper. The punishment now awarded to Brian because his father had done this thing was naturally more savage than before, and he was condemned to embark in the dinghy carrying with him the ship's anchor and our best wishes. When the dinghy took the weight of the anchor at the stern the boat assumed a semi-perpendicular position. In spite of this and the choppy sea, only the heavier waves came inboard and Brian was able to cast anchor some thirty yards distant. The whole crew then hauled on the anchor chain for'ard and Mr. Stuart Turner (our engine) gave of his best in the rear, so that by-and-by *Merlin* slid off the mud for the second time that day. It being a Bank Holiday, a double issue of rum was then served and we moved for base.

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Tuesday's weather (so Roger assured the ladies) was ideal for a beat to Yarmouth. Certainly when we rounded the lightship the wind was blowing strongly from exactly the direction we wanted to go, and the sea was rough and very deserted-looking. The reason why this ship was not fitted with bathrooms was quickly apparent. About every fifth wave, instead of persevering in the rhythmic undulations so much enjoyed by Thelma, her long overhangs (*Merlin's*, not Thelma's) would clout the sea with a shuddering jolt and volumes of cold salt water descended on, and stimulated the spirits of, her crew. In order to avoid excessive speed, the captain ordered the mainsail to be reefed. This seemed fair enough until I learnt that it had to be done (*a*) at once, (*b*) with my assistance. I had been firmly entrenched with my feet locked round the flywheel and was about to take an additional lashing when this order impinged upon me. My progress along the deck is normally characterized by the maintenance of a three-point grip—usually two feet and one hand. In the prevailing conditions I felt that the four-point system was warranted. Thus I reached the mainmast in an octupus-like manner and at once embraced it warmly. My yachting cap rose to a small altitude before taking up the slack in the chin-strap, and when it descended my vision was partially obscured. Sailing before the wind was a more tranquil business and allowed of a much-needed tot of rum being taken by all.

The womenfolk, tired and dishevelled, always produced the right food at the

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right moment. From early morning tea to the final delicacies at supper (laid bare by the tin-opener from stores long cherished) they did us proud. And the men in turn often washed up. Which was rather big of them, I thought.

I evolved a signature tune for my evening task:

"By a babbling brook
In the bilge pump nook
Hear it sook and sook
. . . . . ."

We had an extra tot on account of tomorrow being another Ember Day.

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The entry to Yarmouth harbour is difficult and in spite of the foghorn-like cries of the piermaster we ran aground on the bend, an experience that was now commonplace. With boat-hook and motor assistance we soon cleared, but touched down again nicely beyond the pier in a convenient position for two small boys to watch our evolutions. They maintained a rapid fire of questions concerning the prospects of disaster and were acutely disappointed when we started our final orbit.

The next morning we raised sail in almost a dead calm and floated in a leisurely way towards Spain with the ship's prow pointing Southamptonwards. Mr. S. Turner helped and an hour later we were almost off Yarmouth pier again. Two hours later the engine died. I took her to pieces first—then Roger—then Leslie. How the jet housing became fractured no one quite knew, but the breakdown was obviously of a major order. Jean played noughts and crosses with her toes in the water. Roger lay on his back and drowsed. Leslie obtained a hairpin, a strip of elastoplast and a piece of soap and prepared to perform mechanical magic. I held the tiller. Several times I asked for steering directions, but Roger was listless and Leslie preoccupied and the only answer I got was: "As she goes." It was much later that she went. We scraped ominously on the Brambles. I lifted my feet and waggled the rudder. I changed course 90 degrees without authority. Roger snored. We sailed on.

Leslie put his contraption (which looked like Pilot Officer Prune's finger in a mincing machine) into position and swung the starting handle. S. Turner purred like a kitten. I guess he had never had an A.V.M. plumber working on him before. After all, A.V.Ms.(Tech. E.) are used to bullying 2,000-h.p. jobs into obedience.

We swept in gracefully. I made fast, folded the jib, packed it in the bag that is too small, put on the mains'l cover, pumped out the bilges, coiled up ropes, Navy-fashion, pricked the primus and asked for a drink. They said it wasn't an Ember Day. The double-crossers!

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Au revoir, *Merlin*! I look back with affection at your little narrow cabin and the merry parties we had there: at your mast and rigging, the sails blowing full and tight: at your boom and my bruises: at gallant Mr. S. Turner. And never will I forget Leslie coping with Aunt Violet—it was the only time he stopped singing and took to muttering strange oaths.

Sailing is a wonderfully fine business. We never had a better holiday.

Here's to the next time!

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LATEST SPORT IN R.A.F.

Mountaineering is becoming increasingly popular with all ranks. Above are seen Flying Officer Parish and Aircraftman Greatbatch on the way down the Balitiére (13,000 feet) during a recent meet of the R.A.F. Mountaineering Association at Chamonix. The glacier in the background is the Glacier de Leschaut, which runs down to the Mer de Glace

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SPORT IN THE R.A.F.

By J. Sephton

ASSOCIATION FOOTBALL

ONCE more that popular pastime connected with soccer is in everyone's mind: Who is going to win the F.A. Cup this season? and Who will be league champions? But the most important thought in the minds of the Committee of the R.A.F. Football Association is the building up of a representative team to recapture from the Army the Inter-Services Championship and have "The Royal Air Force" engraved on the Constantinople Cup for the sixth time.

What are the chances? One must agree that the R.A.F. Football Association has got off to a good start. In the first representative match, against a selected Football Association XI which included several players on the verge of international honours, the R.A.F. were narrowly defeated by 2 goals to 1, so the prospects are fairly bright. Several first-class players are now serving in the R.A.F., and with the team captained by Aircraftman J. Service (now on the books of Portsmouth) and including in addition Aircraftman Batchelor (Wolverhampton Wanderers), Aircraftman MacEwan (Arbroath), Corporal Chiswick (West Ham) and Aircraftman Norman (Chelsea), anything can happen. Aircraftman Stephen, who is the veteran—in experience, at least—of the side, is at the moment stationed at St. Athan. He has represented Scotland on three occasions, once against England, at Wembley, and twice against Wales, and was honoured with the captaincy in one of the matches against Wales.

Further representative matches have been arranged against both Oxford and Cambridge Universities and the Civil Service, before the Inter-Services Championship.

The first inter-Service game, between the R.A.F. and the Royal Navy, will be played on 8th March at Elm Park, Reading. The Army battle against the Navy will take place on 15th March at Villa Park, and the final game, R.A.F. versus the Army, at Wolverhampton on 22nd March.

There is no doubt that Association football is the most popular game within the Service. Three competitions are run, the Inter-Command Cup Competition, the Open Challenge Cup Competition (generally known as the Senior) and the Junior Challenge Cup Competition, the last-named being confined to stations and units below a strength of 500 personnel.

In the Inter-Command Championship Fighter Command will no doubt fight hard to remain champions, with R.A.F., Mildenhall, battling hard to win the Junior Competition for the second year in succession. Some ninety-nine units entered for the Junior Competition and 121 for the Open Competition. R.A.F., Halton, who won the Open last year, have already won their way into the third round and are going "flat out" to repeat their 1949 success.

BASKETBALL

One of the junior sports in the Service at the moment, basketball is progressing in leaps and bounds since its introduction in 1947.

Although the game was first played in America in 1892, it was not until 1936 that it was recognized as a major international sport, when Olympic honours were first accorded at Berlin. It was again included in the 1948 Olympics and had one of the largest followings of any of the sports included. The Amateur Basketball Association of England and Wales was founded in 1936, and international rules of the game were officially adopted.

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During the season 1948 the R.A.F. Basketball Association spread its wings and organized inter-command and inter-station competitions, and had the honour of staging the first Inter-Service Basketball Championship.

R.A.F., Halton, who can well claim to be the first station in the Royal Air Force to play basketball, became the first inter-Service champions. They will, however, this season find some tough opposition, fifty-four stations having entered for the competition, and there will no doubt be several exciting matches. Squadron Leader L. C. Boore, the Secretary of the R.A.F. Association, is looking forward to this year's Inter-Service Championship, and with several players who have played for first-class civilian clubs now in the Service he hopes to reverse last year's result, when the R.A.F. were beaten by the Army during extra time. Representative matches against the United States Air Forces now serving in this country and against Oxford University have been arranged, to give the R.A.F. team a thorough test before the Inter-Services Championship.

RUGBY UNION

A record entry of 137 stations was received for the R.A.F. Rugby Union Inter-Unit Cup Competition, now in the fourth-round stage. Three competitions are being run this season: the Inter-Command Cup Competition, the Inter-Unit Challenge Cup Competition and the Inter-Unit Shield Competition.

The Inter-Unit Shield Competition is being introduced to R.A.F. rugby for the first time. The Inter-Unit Challenge Cup Competition is open to twelve senior Royal Air Force units at home selected by the Committee, together with the four semi-finalists in the Inter-Unit Shield Competition. In the Shield Competition all units affiliated to the R.A.F. Rugby Union are automatically entered, but the twelve senior units are excluded.

An attractive programme has once more been arranged for the representative XV this season against some of the leading clubs in the country, including both Oxford and Cambridge Universities.

The Inter-Services Tournament, which of course is the high-light of the season, starts at Twickenham on 18th February, when the R.A.F. play the Royal Navy, with the Royal Navy and Army match on 4th March, and the final game, R.A.F. versus the Army, on 25th March.

The R.A.F. are joint inter-Service champions with the Army at the moment, but it is sincerely hoped that the R.A.F. side will gain the championship this season.

BOXING

Once more the results of the ever-popular Lord Wakefield Boxing Championship have been decided.

The Officers' Team Championship was this year won by R.A.F. Station, Cranwell, with R.A.F., Lyneham, runners-up and R.A.F., North Luffenham and Little Rissington, tying for third place. The Officers' Competition and the Senior Airmen's Competition were staged together at R.A.F., Cosford, as in previous years, but the Junior Airmen's Competition finals were boxed off at R.A.F., Padgate.

R.A.F. Station, Little Rissington, who always seem to do well in the boxing world, won the Senior, with Cosford finishing second and Cardington third.

In the Junior event R.A.F., Calshot, came out on top, with Upper Heyford in second place and Waterbeach third. The organization of these competitions involves some thousand bouts being fought throughout the United Kingdom.

Three trophies, one for each class, were presented to the Royal Air Force

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Boxing Association in 1919 by Lord Wakefield, to promote team spirit and encourage all members of the Royal Air Force to take an active interest in boxing. The competitions are limited to novices who have never won a boxing championship.

The Officers' and Senior Airmen's Trophies were presented at Cosford to the winning teams, as were the medals to the individual winners and runners-up, by Air Marshal Sir John Whitworth Jones, Air Officer Commanding-in-Chief, Technical Training Command. The Chairman of the R.A.F. Boxing Association, Air Commodore H. L. Patch, and the Commanding Officer of R.A.F. Station, Boscombe Down, presented the trophy and medals respectively to the Junior Airmen's Class winners.

GLIDING AND MODEL AIRCRAFT ASSOCIATIONS

Since the last issue of the QUARTERLY two new associations, known as the Royal Air Force Gliding and Soaring Association and the Royal Air Force Model Aircraft Association, have been formed on the same lines as the other sports associations in the Service.

Air Marshal T. M. Williams, C.B., O.B.E., M.C., D.F.C., Air Officer Commanding-in-Chief, B.A.F.O., has kindly consented to be President of the Gliding and Soaring Association. Group Captain G. J. C. Paul, D.F.C., has been elected Chairman, with Squadron Leader D. D. M. Butcher, O.B.E., Air Ministry (O.F.1), Bush House, as the first Honorary Secretary.

The aims of the Association are: "To bring the opportunity of gliding within reach of all members of the Royal Air Force, with special regard to those normally employed on the ground, with the ultimate intention of encouraging soaring in the R.A.F."

Various categories of membership of the Association have been decided which include full flying membership, associate flying membership, private owner members and crew members.

The full flying membership will be open to all who fly, divided into various degrees of qualification, which will be decided by the Flying Committee.

Associate membership is open to all members serving abroad or who are unable to attend the Association's site regularly to utilize the facilities provided.

Members who possess their own aircraft and who wish to utilize the Association's facilities may join the Association under the private-owner scheme.

Crew membership is open to personnel who wish to take part in the activities of the Association but who do not wish to fly as pilots.

Full details of membership subscriptions have not yet been decided, but in the meantime further information may be obtained direct from the Hon. Secretary.

The Model Aircraft Association has been set up under the chairmanship of Group Captain C. F. Pearce, at present stationed at R.A.F., Dibden, with Squadron Leader R. D. Lord, A.F.C., as Hon. Secretary, and one member from each of the home commands and one from No. 90 Group serving on the General Committee.

The Association will be affiliated to the Society of Model Aeronautical Engineers, and will be responsible for the number of clubs already in existence at various stations throughout the country. The Hon. Secretary will be the Royal Air Force representative on the Council of the S.M.A.E.

Membership of the R.A.F. Model Aircraft Association is open to all serving members of the R.A.F., their wives, sons and daughters, and members of the Women's Royal Air Force.

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Vampire pilots in the Operations Room at Gutersloh during the recent military exercise, "Agility." On the left, pilots are being briefed by an Army liaison officer on their target, and on the right others being de-briefed after a sortie by a Royal Air Force officer

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CURRENT EVENTS

UNITED KINGDOM

Festival of Britain

THE exhibition on the south bank of the Thames will be the centre-piece of the Festival of Britain, which will be held from May to September, 1951.

The exhibition will tell a continuous story throughout the whole of its extent, each pavilion providing a chapter in the story. The theme is that British achievements in science, technology and industrial design have resulted from the initiative of the British people in developing the resources of their land and that the future of Britain is well founded on the continuing achievements of her scientists, industrialists, technologists and designers.

In the forefront of subjects in which the British contribution is outstanding will be aircraft. The accent in this section will be on the jet-engine story. The smaller modern aircraft will be shown in full size, the larger aircraft in model form, or by full-size sections of parts or of their internal equipment.

There will also be a section on scientific research for aeronautical development; amongst the exhibits will be a wind tunnel, and/or a smoke tunnel, in operation.

Aids to navigation will be carried chiefly in the telecommunications subsection, where they will be related to all forms of transport. The story of London Airport will be illustrated by a large model with traffic-control instruments and lighting system.

One section in "The Dome of Discovery" will display the latest knowledge of the structure and nature of matter, culminating in a display of nuclear energy. There will also be equipment for a meteorological station, together with radio equipment concerned with long-distance short-wave communications.

The exhibition covers so wide a field of this country's industrial design and the exhibits are so numerous that in comparison, and speaking in general terms, air matters form but a small, although important, part of the whole.

Cranwell

Mr. Geoffrey de Freitas, M.P., Under-Secretary of State for Air, after carrying out his recent inspection of the Royal Air Force College, Cranwell, said:

"I can truly say that Cranwell is one of the most important places in Britain today. The officers trained here will be first the cutting edge of the Air Force, and later the directors and strategists of the Force. With the Royal Air Force as our first line of defence, these young men are among the most important young men in Britain today.

"Each year we require some 150 cadets. The number appears small; but our standards are high, so it is not always easy to get them: we have to turn down hundreds because, fine as many of them are, they have not all the qualities we demand. The cadets I have met today more than fulfil Lord Trenchard's requirement, for the College itself more than fulfils what was envisaged thirty years ago today."

Forty A.T.C. Cadets a Month to Fly Overseas

Regular flights by members of the Air Training Corps and the R.A.F. Section of the Combined Cadet Force to Germany, Pakistan, India, the Middle East and the Far East began in December. About forty cadets a month will fly on scheduled services of R.A.F. Transport Command and serve in the aircraft as assistant air quartermasters. Definite duties on the ground will also be found for them during any lengthy stop on a flight.

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Supervision of the work and welfare of the cadets will be the responsibility of captains of aircraft.

To qualify for flights, cadets must hold the proficiency certificate and intend to make the Royal Air Force their career. Parents' consent is necessary, and for those still at school written approval must be given by headmasters.

All necessary kit, including flying helmets, is provided, and the only charge made will be for messing, which amounts approximately to 2s. 6d. per day. The trip to Singapore and back, for example, will cost 30s.

New Chairman of Flying Personnel Research Committee

Air Marshal Sir Harold Whittingham, K.C.B., K.B.E., LL.D., F.R.C.P., F.R.C.S.(E), has accepted the invitation of the Secretary of State for Air (Mr. Arthur Henderson) to become Chairman of the Flying Personnel Research Committee in succession to Sir Edward Mellanby, G.B.E., K.C.B., M.A., LL.D., F.R.C.P., F.R.S.

The Flying Personnel Research Committee was formed in January, 1939, by the late Sir Kingsley Wood, Secretary of State for Air, on the advice of Air Marshal Sir Victor Richardson, who was at that time Director of Medical Services of the Royal Air Force.

The Committee was formed to advise the Secretary of State for Air in all matters relating to the efficiency of flying personnel. It was a pioneer institution in personnel research and has been responsible for most valuable work in research on the physiological and psychological environment of flying personnel and on means by which men can be assisted to work efficiently in adverse surroundings. In this way, and particularly in regard to the provision of efficient oxygen supplies at high altitudes, the Committee has made an important contribution to the efficiency of the R.A.F. and aviation in general. The Committee has sought to avoid the danger of engineering research outstripping consideration of the vital factors of human capacity and limitations, and it has formed the model on which similar research committees have been based in this country and elsewhere.

Air Marshal Sir Harold Whittingham, a former Director-General of Medical Services of the Royal Air Force, was one of the original members of the Committee and brings to the chairmanship a wide and intimate knowledge of problems of aviation medicine.

R.A.F. Dinner Club Revived

The R.A.F. Dinner Club is to be revived. Membership is confined to pre-war members of the Club and to serving and retired permanent officers not below the rank of wing commander. Membership fees are 5s. a year for annual members and a payment of three guineas for life members. Details may be obtained from the Hon. Secretary, R.A.F. Dinner Club, Room 233, Air Ministry, Adastral House, Kingsway, London, W.C.2.

At the annual dinner of the Club it is customary for the Chief of the Air Staff to give an informal talk.

Air Ministry Catering Branch Reorganized

The Catering Branch of the Air Ministry has been reorganized and up-graded to a deputy directorate, an indication of the increasing importance which the art of catering has assumed in the Royal Air Force in recent years.

A Catering Branch of the R.A.F. was established in January, 1947, and the Catering Branch of the Air Ministry was set up at the same time, as part of one of the deputy directorates of equipment.

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Group Captain W. H. Canniford, who, as a wing commander, has recently been head of the Air Ministry Catering Branch, has been appointed Deputy Director of Catering. He has had a wide experience of Service catering and before going to the Air Ministry in May, 1949, he was Command Catering Officer, Far East Air Force.

R.A.F. Opportunities for National Service Men

There will be 700 vacancies for commissions and 300 places for training as pilots in the Royal Air Force for suitable National Service men during the next twelve months.

Some 300 National Service airmen have already been commissioned or are being trained for commissions. More than 200 are now training as pilots. These schemes were introduced last December. Selection is still going on.

The 700 vacancies are for commissions in the Equipment, Secretarial, Education, Fighter Control and Physical Fitness Branches and the R.A.F. Regiment. These are additional to the commissions granted to graduates in the General Duties, Technical, Education and Airfield Construction Branches and the professional Medical and Dental Branches.

One hundred of the 300 pilot places are reserved for A.T.C. cadets. National Service pilots are trained up to full "wings" standard and all those who are suitable are commissioned in the reserve on finishing their National Service. They promise, as a condition of being accepted for pilot training, to join the R.A.F.V.R. or the R.Aux.A.F. after their National Service.

Glider Pilots Train in Spare Time

Airmen who are keen to fly an aircraft but have never done so are learning to be glider pilots at R.A.F. Station, Linton-on-Ouse, Yorks, as members of the No. 12 Group Gliding Club.

The Club, which is self-supporting, originated at R.A.F. Station, Middleton St. George, Yorks, about two years ago. Since moving to Linton nine months ago its membership has risen sharply, and now totals about fifty, most of them airmen. A few members are pilots of powered aircraft.

Using one or two gliders belonging to the A.T.C. and the R.A.F., and others which Club members have reconstructed themselves from spare parts and scrap, the members spend much of their spare time gliding in the vicinity of Linton. The Club's object is to teach men to become glider pilots through spare-time training.

Chief Instructor and Chairman of the Club is Wing Commander A. J. M. Smyth, O.B.E., D.F.C., Officer Commanding the Administration Wing at the station. A keen glider pilot and ex-Battle of Britain bomber pilot, he took up gliding two years ago while visiting Germany on duty. He later joined the Surrey Gliding Club, and since going to his present station has devoted himself to furthering the interests of the Club.

Another gliding enthusiast is Wing Commander R. H. B. Jackson, Chief Technical Officer at Linton-on-Ouse, who spends most of his spare time building and maintaining gliders for the Club.

Carrying of Canes by R.A.F. Officers

A new Air Ministry Order deals with the carrying of canes by Royal Air Force officers.

Canes may now be carried by station commanders at all times, and officers commanding flying, administration and technical wings at stations and officer

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instructors at recruit and technical training schools may carry them while on parade or on duty within the station bounds only.

The canes, which will be bought by the officers at their own expense, are to be of the swagger type, twenty-four inches long, and covered in black leather. The question of allowing all R.A.F. officers to carry canes will be considered later.

Women Education Officers for the R.A.F.

The first women to be appointed direct from civil life to short-service commissions in the Royal Air Force Education Branch have recently taken up their duties at R.A.F. stations and training schools.

Mess Bar made to look like Old English Inn

Under the direction of their Commanding Officer, Squadron Leader B. A. Wynyard Wright, Royal Air Force officers at No. 41 Reserve Centre, Llandaff, Cardiff, have transformed their austere war-time Officers' Mess bar into a copy of an Old English inn.

With old surplus packing cases the untidy girders were made to look like oak beams, the walls were panelled, and the concrete floor relaid with wood strips. Monk wall-seats replaced the modern bar furniture.

Realizing that the electric-light shades looked somewhat incongruous in the new setting, the officers procured some old-fashioned lamp-shades, which they so fixed as to give the impression that the room was lit by paraffin-oil lamps.

All the work was done by the officers in their spare time and the only expense to Mess funds was 6s. 8d. for oak stain to cover the packing-case floor and panelling.

Air Commodore R. Cadman, Honorary Air Commodore of No. 614 (County of Glamorgan) Squadron, Royal Auxiliary Air Force, and No. 3614 Fighter Control Unit, was so impressed by the "new look" that he suggested that the roof should be thatched, and he procured the services of Mr. Tom Davis, who has done thatch work for members of the Royal Family. When completed the new roof was presented by the Air Commodore to the Mess.

On the walls of the bar is a fine collection of swords, knives and bayonets, all of which have been presented to the Mess by members of the Reserve Centre. Among the collection are a Japanese two-handled sword, a German naval officer's sword, a 200-year-old Austrian sword and a number of Gurkha kukri knives.

[EDITOR'S NOTE.—We had an attractive bar in No. 11 Squadron, R.F.C., in the "bow and arrow war," but had some trouble through K.R. 1697, which clearly now has been buried with Dædalus.]

World Interest in New British Transports

In the past few months the attention of airline operators all over the world has been focused upon the new range of British transports powered by turboprop and turbojet engines. In particular they have studied the remarkable records of the Vickers-Armstrongs Viscount, which, with four Rolls-Royce Dart turbine-propeller engines, has now logged more than 300 hours of test flying in the past eighteen months, and the De Havilland Comet (four D.H. Ghost turbojet engines), which has recently carried out some spectacular test flights.

Both aeroplanes have disposed of many theoretical objections to the use of gas-turbine-engined air liners on scheduled service and have proved themselves so well blessed with attractive qualities that their suitability for airline duty is no longer in doubt.

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At this date Great Britain is the only country which is in a position to accept orders for turboprop-engined types—there are the Mamba-Marathon, the Mamba-engined Apollo and the Theseus-engined Hermes 5, in addition to the Viscount—and the market for jet-propelled air liners is divided between Great Britain and Canada.

Great Britain has always been a big exporter of military aircraft. By her enterprise she has now made herself a leading competitor in the civil market and there is every chance that negotiations now in progress and others in prospect will, over the next ten years or so, result in millions of pounds' worth of foreign orders for British aircraft firms.

* * * *

GERMANY

Gliding in Germany a Popular Sport

The sport of gliding has become so popular in the British Zone of Germany that the British Air Forces of Occupation Gliding Association now embraces seven gilding clubs with a combined membership of 230 men, women and children.

Launched from sites throughout the British Zone, gliding enthusiasts spend many hours of their spare time weekly piloting or riding as passengers or pupils in a variety of gliders over country which once served as training areas for thousands of Germans being taught the art of powerless flight in preparation for such military invasions as those of Crete.

At Scharfoldendorf, on the edge of the Harz Mountains, where the Headquarters of the R.A.F.O. Gliding Club are situated, five women (two nursing sisters from the R.A.F. Hospital at Rinteln, two W.R.A.F. corporals and the wife of a member of the Club) are among the thirty-five members. One of the glider pilots, Corporal Myrtle May, of the W.R.A.F. (of Rayleigh, Essex), recently set up a record for the longest flight by a woman in Germany since the war when she was airborne in a Grunau Baby 2b German glider for five and three-quarter hours.

[Air Ministry Copyright

An unusual occupation for G.C.I. operators. In B.A.O.R. the collection of stray dogs round the camps is a necessity

The chief flying instructor at the Celle Club, in Hanover Province, is Flight Lieutenant Kenneth Hirst, holder of the British national two-seater distance record, established during the B.A.F.O. gliding contest in 1949.

Twenty-four Fairchild C-82's Flown to Germany

Twenty-four Fairchild C-82 Packets were recently flown to Wiesbaden for assignment to the 60th Troop Carrier Group at Rhein Main Air Force Base.

Five of these flying the corridors into and out of Berlin carried such vital equipment as ambulances, dump-trucks, rock-crushers,

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steam-rollers, cement-mixers and other bulky items that could not be carried by the more conventional aircraft.

The Packet, standard troop and cargo transport of the U.S.A.F., termed the Flying Boxcar because of its 2,916 cubic feet of cargo capacity, is of the twin-boom type and powered by two Pratt and Whitney double Wasp engines of 2,100 h.p. each for take-off. It cruises at an average speed of over 200 m.p.h. and is capable of carrying 14,000 lb. of cargo or forty-one fully equipped combat troops for 500 miles. It has a service ceiling of approximately 22,000 feet.

* * * *

MIDDLE EAST

Speedway Racing by R.A.F. in the Canal Zone

Speedway racing is becoming popular in the Canal Zone of Egypt and the R.A.F. now have two teams which ride regularly at the Olympic Stadium at Fayid. The Army, with five teams, have been racing for some years, and now that the R.A.F. have got going inter-Service matches are contemplated.

* * * *

FAR EAST

Aeronautical Inspection Services

The low accident rate of the Far East Air Force is contributed to in no small measure by a group of officers and airmen known as the Aeronautical Inspection Services, or A.I.S. They carry out the greater part of their work at the R.A.F. Maintenance Base, Seletar, near Singapore. Their chief concern is pre-use inspection, which entails the inspection and test of every job of repair work carried out at that maintenance base. In addition to the inspection of repairs effected on aircraft and ancillary equipment, items of equipment held in stores, as well as ammunition, all types of explosives, petroleum products, oils and lubricants used by the Royal Air Force in the Far East, are subject to inspection and test by A.I.S.

A.I.S. inspectors consist chiefly of N.C.Os. of flight sergeant, sergeant and corporal rank, who are given an intensive course of training at No. 4 School of Technical Training, R.A.F., St. Athan, South Wales. The object of A.I.S. inspectors is to ensure the good quality and serviceability of all items of equipment used and, as a consequence, they are called upon to make important decisions which ultimately have a direct bearing upon the safety of the aircraft, passengers and crew.

Malayan Air Training Corps

The first squadron of a new voluntary youth organization, the Malayan Air Training Corps, has been formed at Singapore.

Organized on similar lines to the Air Training Corps in this country, the Malayan A.T.C. is supported by the Governments of Singapore, the Federations of Malaya and the Royal Air Force. It is open to youths between 16 and 18 of all communities who are British or Federal citizens. Members will be trained in a range of flying subjects as a preliminary to entering the R.A.F. or civil aviation. Other aims are to provide recreational centres where boys of all races can meet, and to help develop character with emphasis on the team spirit.

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New Carrier Plane

Combining the heaviest concentration of torpedoes, rockets and machine guns ever incorporated in a single-engine, carrier-based aircraft, the Martin AM-1 Mauler recently underwent carrier tests on the U.S.S. *Kearsarge*.

With a gross weight of more than 22,000 lb., roughly the equivalent of conventional, twin-engine, pre-war commercial air liners, the Mauler is one of the heaviest aeroplanes ever designed exclusively for carrier duty.

Powered by a single Pratt and Whitney R-4360-4 engine, the Mauler has only the pilot for crew. Except for guns mounted in the leading edges of the wings, all armament is carried in shackles under the wings and fuselage.

The Mauler has a wing span of 50 feet 1 inch and is 41 feet 6 inches long and 16 feet 11 inches high. It has a range of more than 2,000 miles and a maximum speed of more than 300 miles per hour.

The three torpedoes carried by the Mauler have a combined weight of 6,270 lb. and the twelve rockets weigh a total of 1,674 lb.

Miniature Radio

A radio receiver and transmitter so small that it fits into a king-sized cigarette package has been disclosed by the Army Signal Corps Engineering Laboratories of Fort Monmouth, New Jersey.

The tiny "transceiver," weighing only 11 oz., will transmit and receive spoken messages over distances greater than 200 yards. It is believed to be the only radio of its size in the world that contains in one package all necessary component parts, including the power supply.

Other sets of comparable size receive but do not transmit. Moreover, they use batteries weighing several pounds which must be carried separately. The new Signal Corps miniature transceiver has two "B" batteries, one "A" battery, a two-foot collapsible whip antenna that folds into the case of the set, four subminiature tubes, plus the usual internal radio components. All this is contained in a metal case that is only one inch thick, two and a quarter inches across the base, and three and a half inches high.

The set also has a built-in speaker and microphone. The lid of the radio case opens slightly to become the bell of the speaker and the opening through which the voice messages reach the microphone.

Pilotless Ram Jet

The longest sustained flights ever made by pilotless aircraft powered by ram jet engines were accomplished by almost wingless missiles tested by the United States Navy at the Naval Air Missile Testing Centre at Point Mugu, California.

The missiles, designated PTV-N-2a (Gorgon IV), have made several sustained controlled flights of more than ten minutes. They were piloted by remote control and tracked by radar.

Free flight was obtained by launching from a mother aeroplane, and flight information was telemetered back to a ground receiving station by an electronic "brain."

The ram jet engine was designed at Navy direction to operate the Gorgon IV at subsonic velocities. The tests were conducted to obtain engine-performance information during controlled free flight.

The PTV-N-2 (Propulsion Test Vehicle) was designed, developed and built, except for the engine, by the Glenn L. Martin Company. The ram jet Gorgon IV engine, sometimes called the "stovepipe," was developed at the University of

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Southern California, and the engines used in the Navy-Martin tests were manufactured by the Marquardt Aircraft Company. Except for a fuel pump, the ram jet has no moving parts and depends for its thrust on a difference in momentum between the entering air and the exhaust gases.

The Gorgon IV is an all-metal, high-winged monoplane, 22 feet long, with a wing span of 10 feet. Gross weight is 1,600 lb., 700 lb. of which is ordinary 80-octane petrol (116 gallons), the ram jet fuel. After the initial ignition of this fuel by the sparking plug the burning and thrust are continuous until the fuel is exhausted.

The circular ram jet on the Gorgon IV is suspended below the fuselage. It is 7 feet long and 20 inches in diameter at the widest point.

The ram jet has no static thrust and therefore cannot take off under its own power. It must be given velocity before launching.

The missile is controlled in flight from a ground station, but it may be preset to perform normal flying functions, such as level flight, dives, banks and turns. Radar is used to follow the flight path from a ground station. The Gorgon is equipped with a conventional rudder and elevator, but uses spoiler ailerons for lateral control.

* * * *

AUSTRALIA

Australian Aircraft Designers get Chance

The Commonwealth Aircraft Corporation, at Fishermen's Bend, Victoria, is to produce to its own design a radically new twin-jet, long-range, all-weather attack fighter, similar to the Lockheed F90.

Approval of the project, announced in Parliament by the Minister for Air, the Hon. Arthur S. Drakeford, opens a new chapter in Australia's aircraft production history.

The initial design, to Royal Australian Air Force specifications, has been drawn and approved. It is likely that two prototypes will be built.

The most radical ideas incorporated and performance expectations are on the "Top Secret" list. It can be said, however, that the plane will resemble very closely in design the recently test-flown Lockheed XF-90—newest twin-jet penetration fighter of the United States Air Force.

The C.A.C. project will be much heavier and bigger than this U.S.A.F. single-seater fighter with its gross design weight of 25,000 lb., almost approaching the specifications of a light bomber. It will be a twin-seater, and its nose will house the latest search radar gear. It will have a needle nose, and a decided sweep back of 35 degrees in the wings, rudder and elevator surfaces. It will have cabin pressurization for operation at very high altitudes—six or eight miles up—and will be equipped with the latest type ejection seats for the crew.

It will be engined with the latest Rolls-Royce centrifugal jets. The prototypes will probably be powered with advance-type Nenes, already projected by C.A.C., but probably has been designed to take the later and more powerful Tay engine, designed to develop 6,000 lb. static thrust at take-off.

These engines will make the machine capable of at least sonic speed—well above 600 m.p.h. in level flight.

Design study of a new machine has been in progress for nine months, and the building of the first prototype is expected to begin in the second half of 1950.

The design is the original conception of C.A.C.'s design team. Its development will be under the supervision of the managing director of C.A.C., Mr. L. J. Wackett, and his chief design engineer, Mr. Douglas Humphries.

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Mr. Wackett and the C.A.C. have already been concerned in the development of ten previous original designs, starting with the Widgeon flying-boat in 1924.

Air Post for Melbourne Man

Melbourne-born Group Captain C. M. Champion de Crespigny has been appointed Deputy Director of Air Support and Traffic Operations at the British Air Ministry.

* * * *

SOUTH AFRICA

Military Academy

South Africa is to establish a Military Academy at Voortrekkerhoogte (Pretoria) in April on similar though not identical lines to Sandhurst in England and West Point in the United States. Although the general system of training will be much the same as at the big overseas military institutions, the South African Military Academy will be adapted to meet South African conditions. It is likely to be opened at the Military College on 1st April, and will offer matriculated youths a four-year degree course.

Future Defence of South Africa's Coastline

It has been decided, in principle, that the Union will eventually assume responsibility for the defence of its coastline, said Mr. F. C. Erasmus, Minister of Defence, in an interview in Pretoria. He indicated that there would be a four-year plan for instruction in coast defence, air and land operations, for which the most modern weapons would be employed. Owing to the high cost of these weapons, the Union would be able to obtain only a limited number, but the Minister said he hoped that they would be sufficient for the training purposes which the Government had in mind.

* * * *

RUSSIA

The Atomic Bomb

Not only has Russia developed an important atomic industry and exploded her first bomb but she has big production plans which will, by 1952-53, give her a stock pile of bombs for use in conjunction with (*a*) her powerful Arctic Air Force which is a force to be reckoned with, even in modern conceptions, (*b*) her fleet of long-range bomb-launching submarines, and (*c*) the fleet of supersonic pilotless missiles which she is developing.

THE UNITED NATIONS

"We have seen the failure, up to the present, of the great World Instrument which we hoped to create to obviate all dangers of war, and enable mankind to move steadily and faithfully forward along its path. We find ourselves in an arming and divided world.

"It is a world which we had hoped had got rid of religious wars, dynastic wars, territorial aggression wars, nationalistic wars. We hoped we had grown out of them.

"But now have come along the ideological wars, which gather together a great many of those evil tendencies which we had hoped the World Instrument would be able to surmount."—Mr. Churchill.

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OUR COMMONWEALTH AIR FORCES

SOUTH AFRICAN AIR FORCE

AN OUTLINE OF ITS HISTORY

By Major P. E. Stableford, S.A.A.F.

INCEPTION

IT may not be generally known that the South African Air Force shares with the Royal Australian Air Force the honour of being the first of the Dominion air forces.

The South African Aviation Corps, formed in 1915 for service in German South-West Africa, was disbanded by proclamation of the Governor-General in 1919, and the South African Air Force was brought into existence to replace it. The following year, as a gift from the Government of the United Kingdom, a hundred Service aircraft and the necessary ancillary equipment to operate them began to arrive in this country. The new Service formed at Zwartkop Air Station, near Pretoria, and on 26th April, 1921, the S.A.A.F. mounted its first guard at that aerodrome, an event which was faithfully recorded by our then one-man photographic section.

THE FIRST WORLD WAR

The first military flying in South Africa, however, took place in 1913 at Kimberley, where ten officers of the Union Defence Force learnt to fly. On the outbreak of the First World War six of these new pilots joined the Royal Flying Corps and saw service in France. They were but the first of several thousands of South Africans who served with the R.F.C. and the R.A.F. during that war, and many of them distinguished themselves. To Major Beauchamp-Proctor, V.C., D.S.O., M.C., D.F.C., Croix de Guerre, Legion of Honour, went the honour of the highest number of victories scored by a South African. Beauchamp-Proctor, who came from Mafeking, had over sixty enemy aircraft to his credit by the time the Armistice was signed.

EARLY ACTIVITIES

In 1920 the epic flight from London to Capetown by Lieutenant-Colonel P. van Ryneveld and Major Quinton Brand in a Vickers Vimy bomber brought public interest in aviation almost to fever pitch, and it was on the crest of this wave of enthusiasm that the S.A.A.F. was launched. Within a very short space of time, however, the S.A.A.F. was faced with the more sober requirement of

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General Sir Pierre van Ryneveld, K.B.E., C.B., D.S.O., M.C., late Chief of the General Staff. Many old friends who served with him in the R.F.C. will remember "Van R's" distinguished service in the First World War, which included memories of St. Marie-Cappelle and No. 45 Squadron, which he commanded so ably until seriously wounded whilst flying the Sopwith "one-and-a-half-strutter"

having to undertake its first operations, when the Union Defence Force was mobilized to quell the armed revolt that was known as the 1922 strike—an industrial disturbance that followed in the wake of the First World War. With that first test behind them the new Service settled down to peace-time routine, which included flying training, photographic survey, meteorological flights, insect spraying, liaison flights to the Middle East and the inevitable flying displays at civil air rallies. On the technical side, a construction programme was undertaken which produced, between 1926 and 1937, about 130 aircraft; these were Westland Wapitis, Avro Tutors and Hawker Harbees (a South African variety of the Hind).

THE SECOND WORLD WAR

The outbreak of the Second World War found South Africa, like the rest of the Empire, ill-prepared. The whole of the S.A.A.F., including the Reserve, numbered less than 2,000 men; of the hundred aircraft on strength, only eight were current operational types. From this shaky start the S.A.A.F. grew to a force of 45,000, which included thirty-six operational squadrons, one operational training unit, twenty-two supply and maintenance units, nine batteries of anti-aircraft artillery and a half-share in thirty-six air schools which were established in South Africa and operated jointly with the R.A.F. under the Empire Air Training Scheme. Squadrons of the South African Air Force operated all round the African coast (including Madagascar) and in the Abyssinian, North African and Italian campaigns, and a wing of fighters reached India just as the war against Japan terminated. Among the outstanding operations undertaken by the S.A.A.F., those to drop supplies on the Polish Resistance Army in Warsaw were probably the most epic. About sixty per cent. of the sorties to Warsaw were flown by Liberators of No. 2 Wing, S.A.A.F. Members of the South African Air Force gained nearly 1,500 honours and awards, including one V.C., thirty-five D.S.Os. and 415 D.F.Cs.

When hostilities in Europe ceased the Air Force was given the task of repatriating the bulk of the Union Defence Force from the Middle East, and in seven months, between July, 1945, and February, 1946, 54,000 men were transported from Cairo to Pretoria—a distance of 4,500 miles—by the transport squadrons of the S.A.A.F.

(To be continued.)

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ROYAL PAKISTAN AIR FORCE

By Air Vice-Marshal A. Perry-Keene, C.B., O.B.E.

AUGUST 15TH, 1947, saw the independence of India after nearly a century and a half of British rule. On that date was created the new Dominion of Pakistan formed from those parts of Indian territory predominantly populated by Moslems. On that day also the Royal Pakistan Air Force was born.

The R.P.A.F.'s development was not according to the plan which sought the difficult solution of handing over the armed forces of an empire to two successors. In essence the idea was to divide the assets of the Royal Indian Air Force in proportion to the numbers opting for it and the R.P.A.F., and for schools and depots to be run by a supreme headquarters on behalf of both air forces until each could make its own arrangements.

But hardly had the cheering for independence died down when Hindu in India set on Moslem, and Hindus and Sikhs were being massacred in Pakistan. Rail communications were at a standstill, chaos reigned and enmity arose between those who shortly before were colleagues. Supreme Headquarters consequently became impotent and all R.P.A.F. personnel at depots and schools in India were evacuated to Pakistan.

April, 1948. Quaid-e-Azam Mohamed Ali Jinnah at Peshawar. On his right, Wing Commander Rehman, Station Commander, and on his left, Air Vice-Marshal Perry-Keene, C.B., O.B.E.

A plan for a self-contained R.P.A.F. had, therefore, hastily to be devised after taking stock of the position. As was expected, the Moslems of the R.I.A.F. had opted almost *en bloc* for the R.P.A.F., leaving the former with almost all the Hindus. The pre-partition ratio of Moslems to Hindus was only 20 per cent. There were ten R.I.A.F. squadrons to divide; only one of these in an operational state was allotted to Pakistan together with the aircraft for a second and a transport squadron *sans* aircraft and almost denuded by the transfer of its personnel to India. For the rest there was a body of officers and airmen, unbalanced in branches and trades, many only partly trained, a few R.A.F. personnel who had volunteered to serve with the R.P.A.F., some aircraft and vast quantities of ex-

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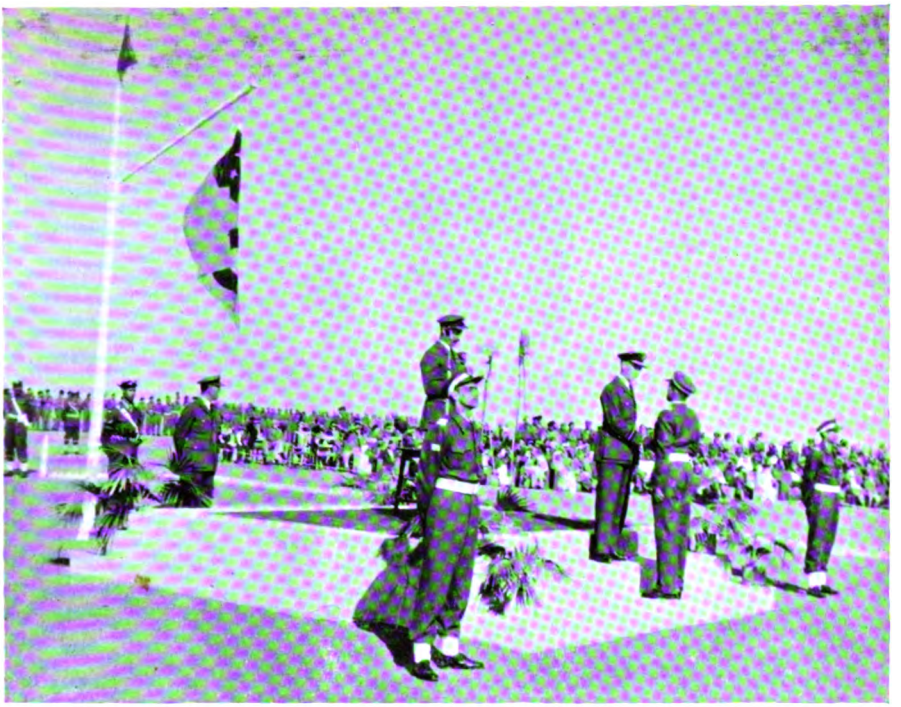

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April, 1948. R.P.A.F. College. The Air Commander congratulates the best cadet

R.A.F. stores—but only in certain ranges. There were also most of the pre-war R.A.F. stations.

The contents of this catalogue had to be sifted and an air force made of it speedily. Watch and ward on the North-West Frontier, which on occasions had employed eight R.A.F. squadrons, had to be maintained, there were demands for communications flying, and above all hung the clouds of war with India.

The pressing need was to get the R.P.A.F.'s allocation of equipment from India; in particular all its Dakotas were there. But Pakistan had many Tempests allotted to India and other vital stores, so the two commanders were able to agree to a form of barter.

Training was given priority, a college being set up at Risalpur with technical schools at Karachi. Higher specialist training was done in the United Kingdom. Alarms and excursions at times made for pressure to increase the front line at the expense of training.

A less serious alarm causer was the Faqir of Ipi, that old acquaintance of the R.A.F. Though a co-religionist of Pakistan's rulers, he was still "agin the Government" and his opening tactics in Waziristan, where there were now no regular forces—except for two Tempests—were successful. A smart counter-offensive by the North-West Frontier irregulars and particularly the Tempests' rockets settled the affair.

More serious was the possibility of the R.I.A.F. and R.P.A.F. fighting each other and the Kashmir war spreading beyond that territory. The two armies were engaged, the Indian Army with R.I.A.F. support. The spark of an incident might start the air war. Violations of Pakistan territory were occurring and

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Pakistan nationals on the border were being bombed. It was a thorn in India's flesh that Gilgit, which they considered part of Kashmir, was being supplied by the R.P.A.F. A Dakota was intercepted and fired on, one of the crew being killed. Pakistan decided that the air-lift must continue, though it was realized that fighter escort would be essential and that a local air battle might lead to an exchange of bombs between Delhi and Karachi.

Officers of the Royal Pakistan Air Force
Centre: *Wing Commander Ashgar Khan, Commandant, R.P.A.F. College*

Fortunately in this strange campaign some of the courtesies of older wars were observed and the Indian Deputy Air Commander came to the enemy's tents at Karachi, where a gentleman's agreement was reached to prevent further incidents.

The welcome "Cease fire" on 1st January, 1949, enabled the R.P.A.F. to continue more normal development. The Royal Pakistan Air Force still has a hard path to follow; its problems are very similar, though on a smaller scale, to those facing the R.A.F. in the early days. That it will become a worthy partner in the Commonwealth's company there is no doubt.

SOLUTION TO A TANGLED TALE

(*Problem on page 34*)

1. From paragraph 3, Robinson and Brown cannot be members of the crew: they would be on duty at 1100 hrs. on Tuesday, 1st March.

2. The navigator is (*a*) a single man, (*b*) a native of Newcastle. Therefore the navigator is neither White (who lives at Islington) nor Smith (who is a widower). Therefore the *navigator* must be *Jones*.

3. Since Smith is as capable of flying an aeroplane as his dead wife (paragraph 2), it is clear that the *pilot* is *White*.

4. Thus the *engineer* is *Smith*.

5. Now Smith kissed Kate at 1100 hrs. on 2nd March (paragraph 3), i.e., when he was on duty in the aeroplane. Therefore Kate must have been one of the passengers. Her name must be Kate Brown, because Robinson is a male—in fact, a bald-headed male. Therefore Kate's father is *John Brown*, landlord of "The Red Hart."

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ROYAL NEW ZEALAND AIR FORCE

ATTRACTING RECRUITS

By Squadron Leader W. C. Thomas, R.N.Z.A.F.

"You are sad," the White Knight said. "Let me sing you a song to comfort you."
"Is it very long?" Alice asked, for she had heard a good deal of poetry that day.
"It's long," said the Knight, "but it's very *very* beautiful. Everybody that hears me sing it—either it brings the tears into their eyes, or else——"
"Or else what?" said Alice, for the Knight had made a pause.
"Or else it doesn't."

THE White Knight might have been talking about recruiting for the Royal New Zealand Air Force, or else, according to reports received, about recruiting for the R.A.F. and other Dominion Air Forces. The best potential recruits are not appearing before selection committees. The Air Force being the most technical of the Armed Services and making the highest demands upon the mental calibre of its personnel, this is a very serious matter indeed. The optimists point to the schools and remark that because the birth-rate was high in the late thirties, and classrooms are now overcrowded, the problem will solve itself in a few years' time. This may or may not be true, but in any case it is a matter of small comfort to the staff officers charged with the responsibility for manning the Air Force now.

In searching for ways and means of attracting the best boys, we can rule out some things for a start. Flying is no longer an attractive novelty, and we cannot offer rates of pay or general conditions of service which are much, if any, better than in many other comparable walks of life. What makes recruiting still more difficult is the fact that we can offer full careers only to a few. We know that this cannot be changed, because it is necessary to build up reserves of fully trained personnel who are still young enough to be mobilized in an emergency. In a generation when the demand for a "safe" career is paramount, it is surprising that we get any recruits at all. But, in any case we *do* lose the best boys.

The next point is obvious. By some means or other we must ensure with convincing certainty that every boy who enlists in the Air Force is embarking on a "safe" career regardless of the length of his engagement. It also seems obvious that this can be achieved by arranging with trades, professions and employing bodies to accept personnel on sufficiently favourable terms. But the fallacy is that under present conditions it is almost impossible to obtain terms of acceptance which are sufficiently attractive. To convince potential recruits, parents and schoolmasters, it is necessary that personnel released should be accepted by civil employers without loss of status, seniority, or opportunity for promotion, as compared with those members of the trade or profession who have served with them from the beginning. It is not reasonable to expect that employ-

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ing bodies will accept such terms in peace time unless the Air Force can demonstrate that the boys being released are better than those already in the trade or profession, and also that their numbers and claims are such that they constitute a "pressure group" which may not be disregarded. Herein lies the answer to the problem, but the method must still be defined.

The key to this stage of the problem lies in the right form and standard of training, and also in unwavering and complete and final acceptance of the following principle:

Whereas in time of war rehabilitation may be partial without detriment to the Service, in time of peace facilities for resettlement must be complete.

It follows that in order to place aircraft in the air for operational purposes, and to be fully effective as a fighting force, the Air Force must first of all devote its main energies to the development of a very high standard of training; and the training provided must consist not only of training for specialized Service requirements but also carefully planned training designed to ensure proper resettlement. In addition, for the time being, and perhaps for all time, the resettlement and Service aspects of training must be given equal status, and regarded in all ways as matters of equal importance. The price to be paid for resettlement training is the price the Air Force must pay for maximum efficiency. There is another point which is equally important. Service and resettlement training must take place concurrently. This is not only a matter of economy in the use of the resources of accommodation, equipment and instructors but it is the only way in which resettlement training can be developed from and through Service training, and the appropriate parts of Service training made to serve the purpose of resettlement. The effect of all this will be that the Air Force will then possess advantages in bargaining with employers. To strike a bargain is the proper approach. It is unavailing to go on bended knees for concessions which can never be sufficient, anyway.

There are important secondary factors. In New Zealand, and probably in most other countries, aviation has grown too fast for the "man in the street" to follow and understand its development; and to the average woman (the mother of the potential recruit) aeronautical matters are shrouded in complete mystery. It is hard to understand this within the Service, but the fact remains that ignorance and suspicion run hand in hand. Moreover, the impression is still fresh in the minds of many people that fighting aircraft are mysterious intruders in the night which not only kill civilians but are also liable to kill the men who fly in them. This unpleasant picture of the glorious achievements of bomber and fighter aircraft is drawn to show why the Air Force is not regarded with the loyal affection given the Navy, which fires most of its broadsides far away from home on the high seas. For this reason, people are not interested in aircraft to the degree that they are interested in ships. The only way to revive interest in aircraft and in flying is for the Air Force to take an active interest in the teaching of aeronautics in post-primary schools, and to develop the Air Training Corps not as a recruiting agency directly but as a youth organization. If this is done effectively, and schools are given every possible assistance, in five years' time the horrors of strategic and tactical bombing will be lost in the glorious achievements of the Battle of Britain and the evacuation of Dunkirk, and in interest created around the work of Air Commodore Whittle and the conquest of the sonic barrier. In this matter the Air Force should work in close liaison with the Air Forces Association and the Royal Aeronautical Society.

As an immediate method for overcoming distrust in the minds of parents it is obvious that something which they can appreciate must be offered. If the boys

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had remained at school instead of joining the Air Force they may have passed a public examination; therefore it is appropriate to create opportunities for recruits to pass these examinations in the course of their Service training; and to encourage them to do so, by some suitable means, provided that their officers consider they have a reasonable chance of success. This is being organized deliberately in some Armed Services at present. The objection to this is that the Air Force is not a public school, but in reply it may be said that it is far better to accept good recruits on such terms than not to have them at all, and it is not difficult to organize suitable classes or to supervise the examinations.

Any publicity released for Press, radio and cinema should be examined not only for security but also for its probable effect on recruiting. For instance, if the Air Force is rejecting a large number of recruits the public should not be told that the Air Force is attracting only the mediocre or poor type of boy. Instead they should be informed that large numbers are not being accepted because the Air Force is endeavouring to set a high standard of entry. As a further example, if the rates of pay are not sufficiently high to be attractive, the publicity directed at parents should include only details of the advancement in pay over the full careers of outstanding personnel (not named, of course). He is a poor parent who lacks all faith in the genius of his offspring.

Mothers of potential recruits will be very interested in the living conditions on Air Force stations. For this reason some publicity, particularly on the screen, should be devoted to the welfare facilities, dormitories and libraries on the station, and to the work of the padre and education officer. In particular, the work of the padre does not receive enough publicity.

SUMMARY

(1) The best recruits will not enlist unless they can be given a full and "safe" career, either within the Service or in conjunction with outside trades and professions.

(2) Whereas in time of war rehabilitation may be partial without detriment to the Service, in time of peace facilities for resettlement must be *complete*.

(3) In order that trades and professions will admit and employ ex-Air Force personnel on terms of equal opportunity with those of the same age, the Air Force must be able to demonstrate that the personnel being released are better than their contemporaries already in the trade or profession, and also that their numbers and claims are such that they constitute a "pressure group" which may not be disregarded.

(4) To do this the standard of training must be high, and must combine both Service training and training in preparation for resettlement.

(5) The combination of Service and resettlement training is not only a matter of economy in training resources but it is the only way in which resettlement training can be developed from and through Service training, and the appropriate parts of Service training made to serve the purpose of resettlement.

(6) The Air Force, in combination with the Air Forces Association and the Royal Aeronautical Society, must directly assist and encourage the teaching of aeronautical subjects in post-primary schools.

(7) Recruiting publicity should be used with finesse, and great care should be taken not to release any information which may create a wrong impression, or otherwise have an adverse effect on recruiting.

(8) Formal provision should be made in the course of training for suitable boys to prepare for, and sit for, public examinations.

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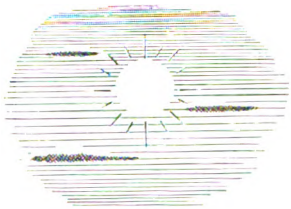

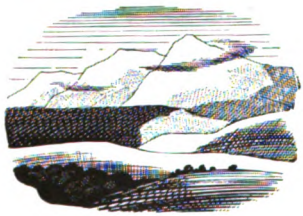

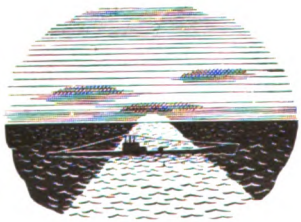

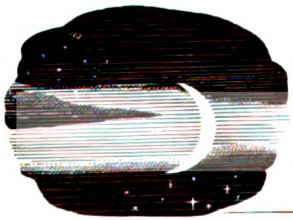

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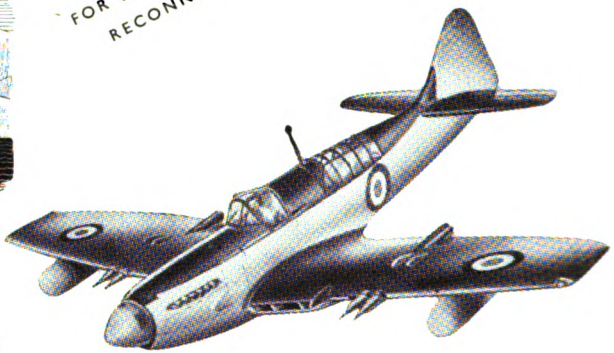

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BOOK REVIEWS

Guided Missiles. By A. R. Weyl, A.F.R.AeS. 139 pp. (Temple Press Ltd.; 7s. 6d. net.)

"This history of guided missiles up to the present day is comparable to a history of aviation written, say, in 1920," and Mr. Weyl makes no attempt to mislead readers into believing that rocket weapons have reached the stage where they can replace conventional bombers, fighters, anti-aircraft guns or artillery. On the contrary, he makes it quite clear that the "experts" who predicted four years ago that efficient push-button weapons were "just around the corner" were right only inasmuch that, in 1950, they are still around the same corner!

This is not a book for the specialist, living in a world of calculus and chemical formulæ. It *is* an ideal introduction to the whole field of rockets and guided missiles for the layman who wonders how these fantastic and rather unpleasant objects are likely to affect his future life, and for the military man who wishes to study their possible effect on future strategy.

Mr. Weyl begins with a chapter on the different classes of missiles; methods of propulsion; ways and means of stabilization; control, guidance and direction; launching methods; payloads and warheads. It is somewhat heavier going than the remainder of the book but should be read carefully, for without this basic knowledge of how missiles work it is impossible to appreciate why it requires well over a million man-hours to perfect even a simple missile like the war-time American "Bat."

Chapters II and III outline the origins and development of guided missiles from the Lorin ducts of 1910 to the fascinating story of V1, not forgetting the amazing prophecies of Jules Verne, who foresaw in 1880 the use against battleships of rocket missiles with target-seeking heads and proximity fuses.

Then follows the most interesting chapter in the book—"The Development of Operational Long-range Rockets." These are the ultimate in push-button weapons, the "super-V2's with atomic warheads" that we have read so much about. Mr. Weyl has no illusions about the time needed to evolve such weapons, pointing out that after four years' intensive research the Americans have yet to produce a rocket better than the comparatively inaccurate and ineffective V2, although they have made some progress with radio control of large rockets.

Nor is large-scale production less of a headache when design problems have been solved. For example, Hitler planned to bombard Britain with a thousand rockets a day, and what this meant in terms of war effort is summed up in Mr. Weyl's remark that "in one underground works, at Nordhausen, [it required] 30,000 workers with 25,000 machine tools [to complete] thirty rockets daily."

Chapter V—"Smaller Types of Guided Missiles"—deals with all the German and American air-to-air, air-to-ground and ground-to-air missiles of which details are known. It also reminds us that German experts were "immensely impressed" during the war by Russian progress in this field, so we should not overlook the fact that the Russians, now helped by some of Germany's finest scientists, are almost certainly in the forefront of missile development. There are few details of British experiments, as most are still secret.

Finally, Mr. Weyl includes a chapter on the future, pointing out that military rockets are not a complete loss socially, as they may well pave the way for space-travel, and eventually permit control of the weather. The reader may, however, be forgiven for laying down this book with the feeling that we may not solve the problems of how to fly to the moon, in one piece, by rocket space-ship before we are blown there in lots of pieces by a super-V2.

J. W. R. T.

For Valour. By Kenneth Hare-Scott. (Peter Garnett; 10s. 6d.)

The author successfully achieves his aim in this book of tracing the origins, influences and characteristics which mould the lives of famous heroes who came from all walks of life in Britain and the Commonwealth. The biographies of thirteen recipients of the Victoria Cross, with accounts of how each displayed the greatest courage in the face of the enemy, provide reading that is not only intensely interesting but gives inspiration to dispel gloomy thoughts occasioned by those who suggest that we are a decadent nation.

The biographies and illustrations include both officers and men of the Navy, Army and Air Forces who won the highest award during 1939-45. Those selected from the Air Force recipients of the Victoria Cross are Leonard Cheshire, Antony Lord and David Hornell.

A. H. S.

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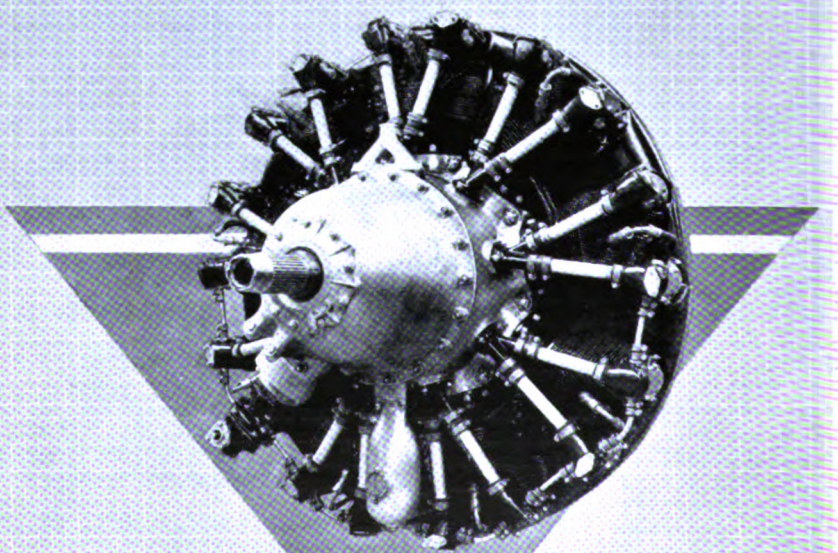

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Offshore. By John H. Illingworth. (Robert Ross; 45s.)

The sea is one of the forces in the world that can offer to all and sundry a relentless opposition. In former days a lot of character-building in the Services took place during wars and campaigns, when the enemy gave no quarter and there was no chance of giving up a struggle at one's own time unless it had been completed. The opposition was bound by few rules and made no concessions of time or numbers. There was no referee and there was often the stake of one's own life as well as the lives of one's fellows set up against the chance of enemy winning. Nowadays some equally implacable opposition must be provided because artificial warfare and operating conditions are not proving an adequate substitute. Nature is able to provide the opposition and off-shore racing is one of the times when there has often to be a tough struggle without the chance of pre-setting the stage.

Captain (E) John Illingworth, R.N., is not only an extremely skilful yachtsman but he is one of the most successful owners in the sport today. This book is an authoritative account of the whole of the sport, but it is more than that: it is an object lesson in the art of succeeding. It has lessons in it for everyone who sets out to do anything whether it is just in making a career or becoming a world-beater in some sport. Read this passage and you will begin to realize why it is that so many textbooks are just not deep enough to be called first-class works. Everyone can see the need that has to go into meticulous preparation for success when it is realized that the Fastnet race lasts for at least five days.

"The Post-Mortem. Apart from paying unrelaxed attention to the job of ship driving, the thing which wins races is not so much brilliant strokes of tactical genius as the business of avoiding mistakes. After a race I try to tot up the cost of mistakes I have made. They come to a surprising total of time and they serve to keep one humble and, one hopes, to assist in avoiding a repetition at least of these particular faults.

"In the case of the Fastnet of 1947, which we won with *Myth of Malham*, here from my notebook are a list of mistakes and the time I think they cost us:

"(1) Starting too close under the starting vessel and late at the line: ¼ min.

"(4) Snarl up when changing a headsail at night, turning to windward due to failure of a halyard winch, etc.: 6 min.

"(6) Hanging on too long to the ghosting genoa when wind freshened and came ahead off the Lizard: 4 min."

This book is recognized as the first really authoritative one on off-shore racing, but it is not only for those who actively sail in the sport: it is full of sound instruction for the ordinary sailor or the man who follows on shore where others sail. It is a valuable book for those who cruise and they need not be put off by the apparent wealth of detail that it contains; it is a book of reference that can be studied at great length according to one's whim to learn or to check points at some time.

For those who fly or serve in ground duties, I would recommend that this book is studied as an example of the amount of knowledge that has to be absorbed by anyone who is serious about himself and his profession. To operate an aeroplane and a squadron is no more complex than to a race a boat, but there are few of us who can claim to have studied our profession in a manner that approaches the depth which the author sets out for us here.

I would like to see this style of book copied in other spheres. How pleasant to have such a volume, well printed and with delightful illustrations, for the junior officers who go through a training college! Even better to have another one for the more senior officers who should have guidance when they have passed through the learning stage and want to be told how deep can be the enthusiasm and confidence needed to drive ahead.

N. W.

War in Three Dimensions. By Air Vice-Marshal E. J. Kingston-McCloughry. (Jonathan Cape; 10s. 6d.)

The theory of warfare for the new era initiated by the conquest of the third dimension by aircraft and rocket projectiles is a subject of much controversy today. As the author points out, the principles of two-dimensional warfare have been studied over centuries. Military thought is imbued with them, and there is a natural mental resistance to change or adaptation of outlook and the usual reluctance to discard doctrines which have become ingrained.

Nevertheless, with the introduction of war in three dimensions new strategy has asserted itself and Air Vice-Marshal Kingston-McCloughry's experience in the planning of the Normandy invasion and his many years of professional study, have enabled him to write a deeply interesting book on the principles of strategy in modern war.

It offers a useful basis for discussion on the modern theory of warfare for the future by officers of all three Services.

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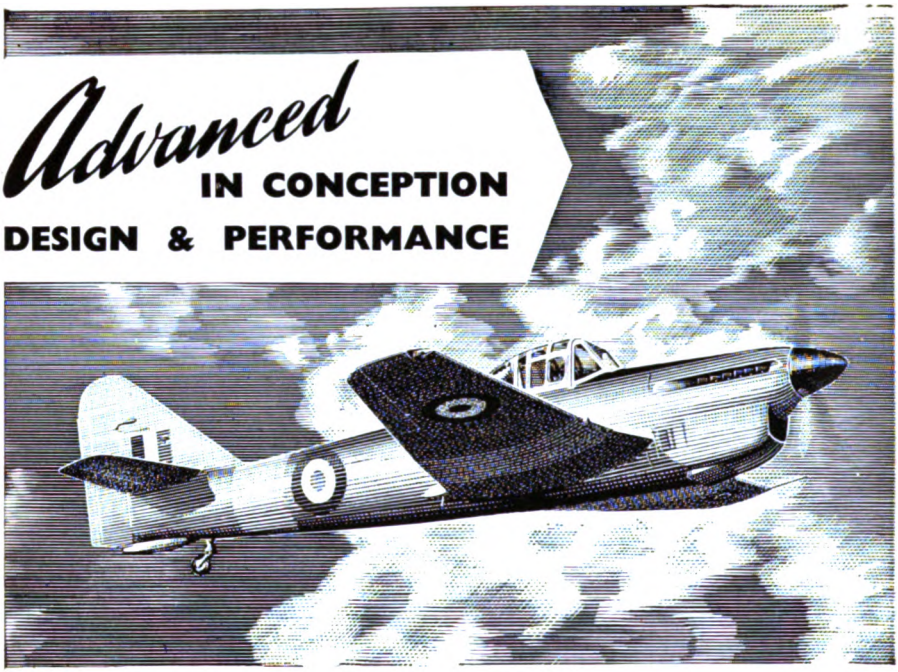

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Wings of the Phoenix: The Official Story of the Air War in Burma. By Leslie Kark. (H.M.S.O.; 5s.)

Early in 1942 Burma was conquered by the Japanese. It was to be a stepping-stone to the invasion of India. But the Allies, fighting back from the frontiers, reconquered the whole country. The story of the great part played in that reconquest by the Air Forces is told in *Wings of the Phoenix,* which absorbs twenty-two illustrations and five maps.

A wall of mountains isolated North Burma from the world. There was no road from India to Burma. No army in history had ever taken Rangoon from the north—until air power showed the way. The author tells of the fighting withdrawal before the Japanese onslaught, of the building up of strength in Northern India, of incessant harassing of the enemy and bombing of his supply routes as he sought to mount his invasion of India. Operation "Thursday" is included, when 9,000 men, with their pack animals and equipment, were set down by gliders and Dakotas in the jungle, far behind the Japanese lines; of how, in 758 sorties of aircraft, the entire 5th Indian Division was moved from one battle area to fight three days later in another—a move which by land would have taken a month; of how, in the space of three months, 10,000 wounded and sick were evacuated by the R.A.F. alone. It also tells of the great southward drive for the liberation of Burma by the famous Fourteenth Army, supported and entirely supplied by air power—"An army advancing on the wings of an air force."

To read this book is to understand Lord Mountbatten's farewell message to the joint British-American Eastern Air Command: ". . . Through your action you made it possible to reconquer Burma from the north, which was generally held to be militarily impossible."

A. H. S.

Raggle Taggle. (Gale & Polden Ltd.; 30s.)

Originally printed for private circulation only, this book of 142 pages, 10 inches by 12 inches, and colourfully illustrated, has now been made available for general sale. Forewords have been written by the senior British, American and Dutch officers.

It comprises a collection of stories, poems, articles, sketches and drawings compiled from the magazine produced under unusually difficult conditions and with inferior and unsuitable materials in the prisoner-of-war camp at Shirakawa, Formosa, during the year 1944. Its rebirth in a form lavish in quality is to meet the hopes of all those who wished to perpetuate the spirit of ingenuity and indomitable inventiveness which *Raggle Taggle* proudly represents, which for so long and in so many varied ways, in those dark days succeeded in preserving sanity and humour and stimulating thought and discussion.

Knowing the appalling conditions under which the original magazine was produced, those fortunate enough to possess a copy of its reproduction in the new form will realize that for those responsible for its compilation:

"Stone walls do not a prison make,
Nor iron bars a cage":

because, reflected in all its pages is British humour at its best.

To do full justice to authors, artists and the occasion it commemorates it has been produced in the very best style on art paper suitably bound. Although it will be of particular interest to those who had friends and relations who were prisoners of the Japanese during the war years, it is a book that no one should be without.

A. H. S.

Aircraft Engines of the World, 1949. 7th Edition. By Paul H. Wilkinson. Sir Isaac Pitman & Sons; 50s.)

A fully illustrated reference book devoted to the specifications of jet and reciprocating aircraft engines. The Jet Engines and Gas Turbines section comprises a hundred pages, with an Introduction which reviews jet-engine activities in nine countries, describes the latest engine accessories, and includes tabulations of thirty turbo-jets and fifteen turbo-props. There are forty complete standardized specifications of man-power plants, of which twenty are new.

The Reciprocating Engines section comprises 192 pages, with details equally extensive.

A. H. S.

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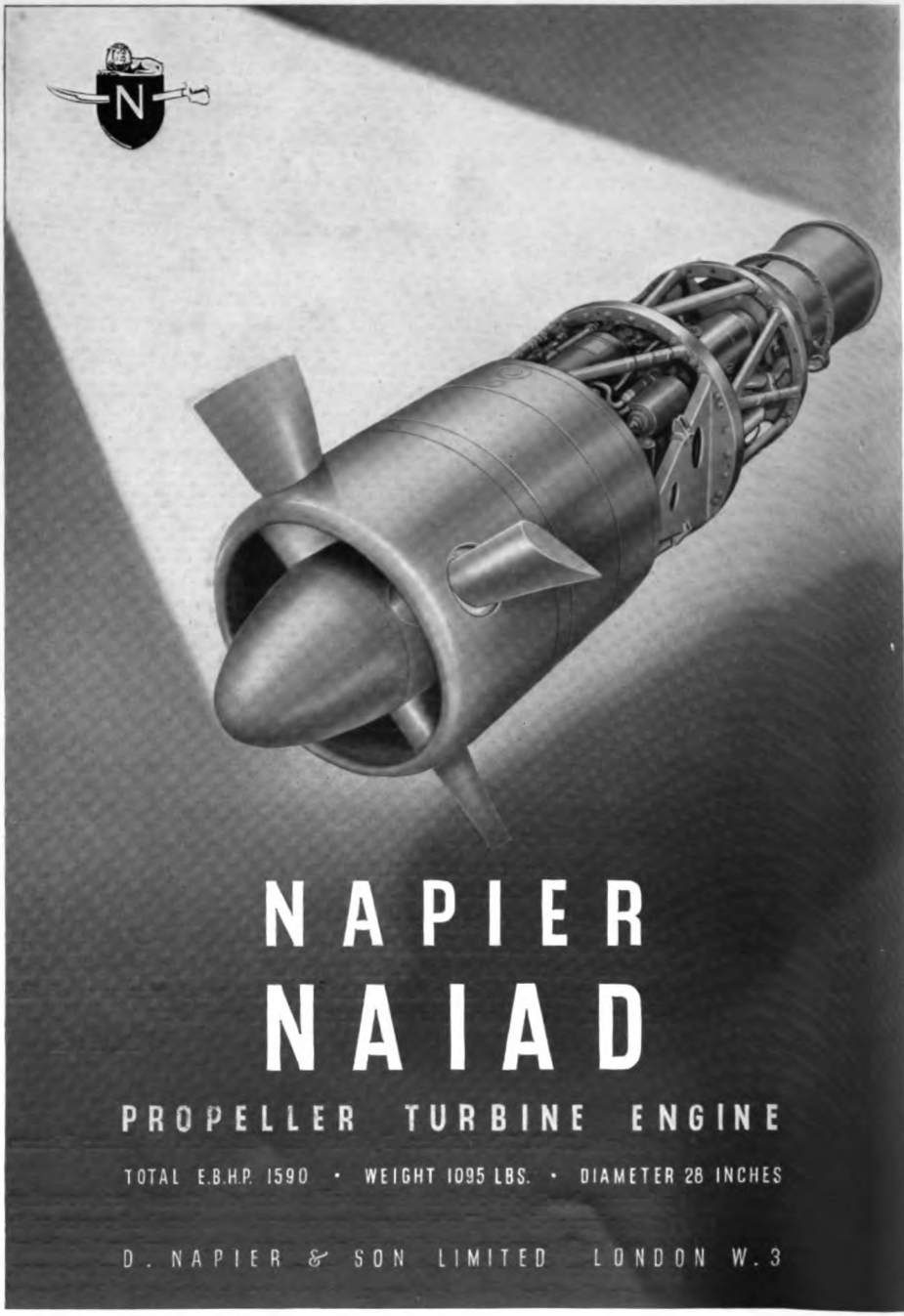
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NEW BOOKS

AIR AFFAIRS

War in Three Dimensions. By Air Vice-Marshal E. J. Kingston-McCloughry. 154 pp. (London: Cape, 1949.)

Strategic Air Power: The Pattern of Dynamic Security. By Stephen T. Possony. 313 pp. (Washington: Infantry Journal Press, 1949.)

Forty Years of Flight. (Romanes Lecture delivered in the Sheldonian Theatre, Oxford, 17th May, 1949.) 16 pp. (Oxford University Press, 1949.)

A Special Study of Operation "Vittles." (Story of the Berlin Air-Lift.) 120 pp. (New York: Conover-Mast Publications Inc.)

Air Transportation and National Defense. (Lecture delivered in the Library of Congress on 21st January, 1946, with Introductory Remarks by F. Trubee Davison, President of the Air Power League.) 21 pp. (Washington: Library of Congress.)

The Observer's Book of Aircraft. By Joseph Lawrence. 250 pp. Full illustrations of 199 aircraft for recognition. Pocket size. (Frederick Warne, 1949; 4s. 6d.)

SECOND WORLD WAR

Ack-Ack: Britain's Defence against Air Attack during the Second World War. By General Sir Frederick Pile. 410 pp. (London: Harrap, 1949.)

Personnel Selection in the British Forces. (Dealing with scientific methods of personnel selection in the Services in the Second World War.) 324 pp., with Bibliography. Published by permission of the Admiralty, Army Council and Air Council. By Philip E. Vernon and John B. Parry. (University of London Press, 1949.)

British War Economy. Vol. I of the Official History of the Second World War—United Kingdom Civil Series. By W. K. Hancock and M. M. Gowing. 583 pp. (London: H.M.S.O., 1949.)

Destiny Can Wait. A History of the Polish Air Force in the Second World War. 389 pp. (London: William Heinemann, 1949.)

INTERNATIONAL AFFAIRS

Atlantic Pact, Commonwealth and United Nations. Prepared for the United Nations Association by Andrew Boyd and William Metson. 100 pp. (London: Hutchinson, 1949.)

Human Rights: Comments and Interpretations. A Symposium edited by UNESCO, with an introduction by Jacques Maritain. 288 pp. (London: Allan Wingate, 1949.) Note: the Charter of Human Rights adopted by the General Assembly of the United Nations in Paris on 10th December, 1948, has been published as Command Paper 7662.

UNITED STATES OF AMERICA

The (U.S.) National Security Organization. A Report to Congress by the Commission on Organization of the Executive Branch of the Government. Chairman: Herbert Hoover. February, 1949. 30 pp. (Washington: U.S. Government Printing Office, 1949.)

NAVAL

The Naval Defence of India. By K. B. Vaidya. 248 pp. with a Bibliography. (Bombay: Thacker & Co., 1949.)

U.S.S.R.

Soviet Arms and Soviet Power: The Secrets of Russia's Might. By Augustin Guillaume (General, French Army). 212 pp. Deals also with Russia's part in the Second World War: with a short chapter on the uses of air forces and six appendices giving information on the Soviet Military Services, and one on Red Army material, including a section on aircraft. (Washington: Infantry Journal Press, 1949.)

If Russia Strikes. By George Fielding Eliot. 252 pp. With a chapter "Could Air Power defeat Russia?" (Indianapolis and New York: Bobbs-Merrill Co., 1949.)

The Rise of Russia in Asia. By David G. Dallin. 293 pp. (Yale University Press, 1949.)

Russia Astride the Balkans. By Robert Bishop and E. S. Crayfield. 287 pp. Previously published in U.S.A. (London: Evans Bros. Ltd., 1949.)

EUROPE

Balkan Politics. By Joseph S. Roucek. 298 pp. International Relations in No Man's Land. (London: Oxford University Press, 1949.)

Behind Europe's Curtain. By John Gunther. 343 pp. (London: Hamish Hamilton, 1949.)

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DIPLOMATIC AND WAR MEMORIES

Eastern Approaches. By Fitzroy Maclean, M.P. 543 pp. An account of the author's experiences after being dropped by parachute in Yugoslavia. (London: Jonathan Cape, 1949.)

MACHINERY OF GOVERNMENT

Modern Foreign Governments. By F. A. Ogg and Harold Zink. 1,004 pp. An American work dealing historically with the main features of the modern systems of government in England, France, Germany, Scandinavia, Russia, Argentine and Japan. (New York: Macmillan, 1949.)

ARTICLES OF INTEREST IN PERIODICALS

"R.U.S.I. Journal"

"The Air Situation in a Joint Appreciation," by Wing Commander J. R. Gordon-Finlayson. (August, 1949; pp. 404-08.)

"Air Defence in Future War," by Flight Lieutenant J. Stephen. (August, 1949; pp. 409-412.)

"The Economist"

"Back to the Atom." (1st October, 1949; pp. 706-08.)

"Canada's Defence Problems." (17th September, 1949; pp. 622-23.)

"The Royal Air Force Quarterly"

"Command and Leadership," By Air Chief Marshal Sir John Slessor. (October, 1949; pp. 89-95.)

"The Future of Air Bombardment," by Air Marshal Sir Robert Saundby. (October, 1949; pp. 101-05.)

"Military Applications of the Helicopter," by John W. R. Taylor. (October, 1949; pp. 107-22.)

"The Part of Strategic Bombing in Modern War," by Wing Commander W. P. Whitworth. (October, 1949; pp. 113-20.)

"Journal of the Royal Aeronautical Society"

"Accident Investigation in Relation to Aircraft Design," by Air Commodore Vernon Brown. Lecture before the Society on 7th April, 1949. Author is Chief Inspector of Accidents, M.C.A. (September, 1949; pp. 829-58.)

"Flying" (U.S.A.)

"The Helicopter Goes to Sea," by William Leary. The Helicopter in the U.S. Navy. (September, 1949; pp. 26-27 and 77-79.)

"Aeronautical Engineering Review" (U.S.A.)

"Atomic Power and its Implications for Aircraft Propulsion," by Dr. L. R. Hafstad. Address at a meeting of the Institute of the Aeronautical Sciences (U.S.A.), 22nd July, 1949. Author is Director of Reactor Development, U.S. Atomic Energy Commission. (September, 1949; pp. 20-21 and 42-46.)

"Aero Digest" (U.S.A.)

"Unification of U.S. Armed Forces." The whole of this issue of *Aero Digest* is devoted to articles on this topic. There are a number relating specially to air matters. (September, 1949.)

"Air University Quarterly Review" (U.S.A.F.)

"Ideas are Weapons," by Colonel Burchinal, U.S.A.F. Air power emerges as the decisive force in modern war; no prepared attack launched in effective force was ever stopped short of its target; quality is the paramount consideration in developing combat capabilities. (Fall, 1949; pp. 3-12.)

"A Matter of Nomenclature," by J. M. Spaight. Contrasts of strategic and tactical bombing and suggests a change of name for these missions. (Fall, 1949; pp. 24-29.) See also deeply interesting article by this well-known author entitled "The Ghost of Douhet" in April, 1949, number of THE ROYAL AIR FORCE QUARTERLY.

"Human Relations in Unification," by Colonel Joseph C. Reddock. Sets forth certain recommendations for facilitating the unification of a nation's defence forces. (Fall, 1949; pp. 30-34.) The author is Secretary to the U.S. Representatives, United Nations Military Staff Committee, and was formerly Chief of Staff, 13th Bomber Command.

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CONCERNING PERSONNEL

ROYAL AIR FORCE PROMOTIONS AND APPOINTMENTS

Among the appointments announced by the Air Ministry since the issue of the last number of the journal were the following:

Air Ministry

Marshal of the Royal Air Force Sir John C. Slessor, G.C.B., D.S.O., M.C., A.D.C., to be Chief of the Air Staff, on the retirement of Marshal of the Royal Air Force The Lord Tedder, G.C.B., D.C.L., LL.D., 1st January, 1950.

Air Marshal Sir Leslie N. Hollinghurst, K.C.B., K.B.E., D.F.C., to the Air Council as Member for Personnel.

Air Chief Marshal Sir William Forster Dickson, K.B.E., C.B., D.S.O., A.F.C., to the Air Council as Member for Supply and Organization in March, 1950.

Air Marshal Sir Aubrey Beauclerk Ellwood, K.C.B., D.S.C., as Deputy Chief of the Air Staff in February, 1950.

Air Commodore D. H. F. Barnett, C.B.E., D.F.C., A.D.C., as Director of Operations.

Air Commodore O. K. Griffen, C.B.E., as Director of Postings (B).

Group Captain C. M. Champion de Crespigny as Deputy Director of Air Support and Transport Operations.

Group Captain R. C. Dawkins as Deputy Director of Accidents.

The Reverend John R. Appleyard as Principal United Board Chaplain, R.A.F.

HOME COMMANDS

Inspectorate-General

Air Marshal Sir Hugh W. L. Saunders, K.B.E., C.B., M.C., D.F.C., M.M., as Inspector-General of the Royal Air Force.

Bomber Command

Air Marshal Sir Hugh Pughe Lloyd, K.B.E., C.B., M.C., D.F.C., as Air Officer Commanding-in-Chief, in February, 1950.

Coastal Command

Air Marshal Charles Ronald Steele, C.B., D.F.C., as Air Officer Commanding-in-Chief.

Air Vice-Marshal Sidney Norman Webster, C.B.E., A.F.C., as Senior Air Staff Officer.

Reserve Command

Air Marshal Robert Mordaunt Foster, C.B., C.B.E., D.F.C., as Air Officer Commanding-in-Chief.

Group Captain G. P. O'Connel as Principal Medical Officer, Headquarters.

Maintenance Command

Air Marshal Thomas Arthur Warne-Browne, C.B., C.B.E., D.S.C., as Air Officer Commanding-in-Chief.

Flying Training Command

Air Vice-Marshal Francis Frederick Inglis, C.B., C.B.E., as Senior Air Staff Officer.

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Ministry of Supply

Air Commodore G. B. M. Rhind as Director of Servicing Research and Development.

R.A.F. Station, Henlow

Air Commodore D. W. R. Ryley, C.B.E., as Commanding Officer.

R.A.F. Selection Board

Air Commodore D. N. Roberts, O.B.E., A.F.C., as President.

R.A.F. Staff College

Group Captain F. F. Rainsford, C.B.E., D.F.C., to the Directing Staff.

OVERSEAS

United States of America

Air Chief Marshal Sir George C. Pirie, K.B.E., C.B., M.C., D.F.C., LL.D., to Washington as Head of the Air Force Staff, British Joint Services Mission in the U.S.A.

Air Vice-Marshal G. E. Gibbs, C.I.E., C.B.E., M.C., as Chairman of the United Kingdom Delegation to the Military Staff Committee, United Nations Organization, New York.

Middle East Air Force

Air Marshal Sir John Wakeling Baker, K.C.B., M.C., D.F.C., as Commander-in-Chief.

Air Vice-Marshal Victor Emmanuel Groom, C.B., C.B.E., D.F.C., as Air Officer Commanding No. 205 Group.

Air Vice-Marshal Charles Edward Hamilton Allen, C.B., D.F.C., as Senior Technical Officer, Headquarters.

Far East Air Force

Air Marshal Francis Joseph Fogarty, C.B., D.F.C., A.F.C., as Commander-in-Chief.

Air Vice-Marshal Robert Lenton Ragg, C.B., C.B.E., A.F.C., as Senior Air Staff Officer, Headquarters.

Malta

Air Vice-Marshal N. H. D'Aeth, C.B.E., as Air Officer Commanding.

Pakistan

Air Commodore G. B. Keily, D.F.C., A.F.C., as Air Officer Commanding No. 1 Group.

East Africa

Air Commodore E. D. H. Davies, C.B.E., as Air Officer Commanding.

Ceylon

Air Commodore F. L. Pearce, C.B.E., D.S.O., D.F.C., as Air Officer Commanding.

RETIREMENTS

Air Chief Marshal Sir Charles E. H. Medhurst, K.C.B., O.B.E., M.C.
Air Marshal Sir Alan Lees, K.C.B., C.B.E., D.S.O., A.F.C.
Air Marshal Sir Cyril B. Cooke, K.C.B., C.B.E.
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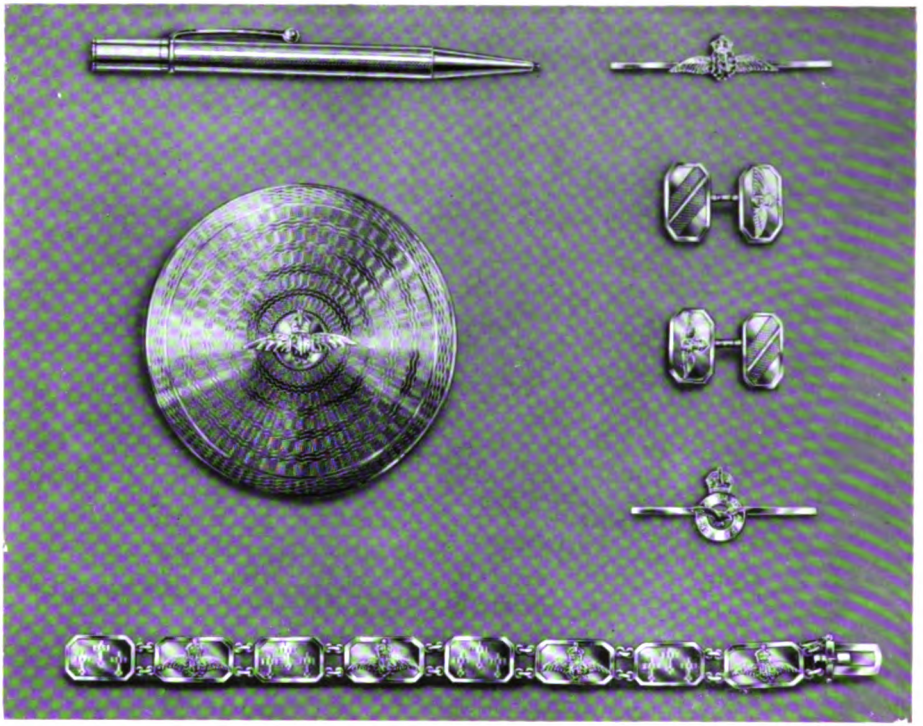

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THE R. A. F. QUARTERLY
AND COMMONWEALTH AIR FORCES
JOURNAL

EDITOR
GROUP CAPTAIN A. H. STRADLING, O.B.E., R.A.F. (RET.)

Assisted by an Air Ministry Advisory Committee of members of the Royal Air Force and Air Forces of the Commonwealth

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EDITOR.

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[Air Ministry Photo

"In spring a young man's fancy . . ." They have not a care in the world—or have they?

[Air Ministry Photo

Fitting themselves for a great task and getting ready to shoulder a grave **responsibility**

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EDITORIAL

"IN spring a young man's fancy . . ." We are now *enjoying* another period of peace; it is not a tranquil peace, but more in the nature of Mr. Chamberlain's hopeful but entirely erroneous "peace in our time."

Our first frontispiece picture shows representatives of the fighting Forces, who apparently have not a care in the world. This is astonishing when they must know that all the Great Powers are arming as fast as their finances, man power and industry permit. Why does this cause no anxiety as to the future?

It is because there is now a tendency in this country to separate the great and small issues, to take the point of view that the large ones are determined in Parliament and that they are no direct concern of the individual citizen pursuing his ordinary affairs within close horizons. This complacency and apathy are the chief cause of half this country's troubles.

What has caused the present oyster-like outlook? Possibly a sense of the hopelessness of individuals to influence the great issues upon which the continuance of peace depends. This is a wrong assumption and it is seriously affecting the incentive to save money for the future, marry and raise children or plan careers.

This is a shocking state of affairs; bad for the morale of the nation, detrimental to our industrial progress, and contributing to the uncertainty of "peace in our time."

Never before in our history has it been more necessary to look to the future, plan, work and unite all classes to meet the difficult times ahead.

In these unhappy days peace is no longer secured by non-aggression treaties, which are now but scraps of paper, and the security they give is as flimsy as the material upon which they are written. Nowadays the only guarantee a country can possess of being free from aggression is to have in immediate readiness fighting forces superior to the potential aggressor's. Owing to the insignificance of our numbers, this can only be achieved by the superiority of our fighting men and the arms with which they are provided.

Already the fallacy of depending upon "secret weapons" has been made abundantly clear.

In the past it is possible that the monopoly of the atomic bomb by the Western Allies contributed to the continuance of peace. Nearly a year ago the U.S.S.R. exploded her first atomic bomb and changed the situation.

It is possible that our superior stock pile of these bombs might still deter any potential aggressor while any significant difference existed, but the race is now on—the race for more and more of these powerful instruments of destruction. With plans in operation which produce at least four of these bombs monthly, Russia aims, by increased production, to equalize and then exceed the stock piles of the West. As this last flimsy security fades, a fresh hope—a new "secret weapon"—is discovered by the Western Allies, an even more frightful engine of wholesale destruction, the hydrogen bomb.

Once again the lessening of our anxieties was for only a brief period; it is no longer safe to rely upon this new invention as a guarantee of peace. Since the

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trial of Dr. Fuchs certain matters have come to light which cause us to believe that the U.S.S.R. already have the secret of the hydrogen bomb and may even have exploded one—and made others.

To what conclusion does this lead? We stand at the cross-roads. Who can say in which direction peace lies? It is clear that to devote all our national wealth, material resources and energy to building up costly armaments will eventually bring us to economic ruin and destruction, but while the international situation remains as it is, destruction is likely to fall upon us much sooner if we follow the advice of some and take the appalling risk of unilateral disarmament.

Does this mean that we are necessarily doomed sooner or later to be plunged into a war that, win or lose, it will make but little difference, as the devastation will be so great that civilization will perish? What does sane and balanced thinking suggest tha twe should do—and do quickly—to avert such a catastrophe?

Until the great statesmen of those nations most concerned find the "lost road to peace" we must put ourselves in a state of readiness to defend this country against any surprise attack.

It is freely admitted that our first essential is command of the air; therefore, even at the expense of other Services, our Air Force must be brought up to the greatest peak of efficiency that our national resources can support. The R.A.F. *must* be given the skilled tradesmen that they now lack and be re-equipped with all possible speed with the most modern aircraft. To the officers and men of our air forces at home and overseas we would say: "On duty devote all your energy and thought to fitting yourselves for this great task and grave responsibility; when off duty, by your understanding and patriotism help to weld the nation into one, as in the hands of every one of us lies, in varying degree, the fate of all of us."

Not only must complacency and apathy be dispelled but there must be a revival of "the Battle of Britain" spirit in every member of our air forces if our first line of defence is to be a sure shield against an unexpected onslaught.

We cannot do better than conclude with a quotation used by the Chief of the Air Staff in his article in this journal last October. It is taken from John Buchan's book on Montrose, and we commend it to officers and airmen alike. If every member of the Air Force had these endowments we should be unconquerable:

"First, there will be fortitude, the power of enduring when hope has gone, the power of taking upon oneself a desperate responsibility and daring all. There must be self-forgetfulness, a willingness to let worldly interests and even reputation and honour perish if only the task be accomplished. The man who is concerned with his own repute will never move mountains. There must be patience, supreme patience, under misunderstandings and setbacks and the muddles and interferences of others. There must be resilience in defeat, a manly optimism which looks at all the facts in all their bleakness and yet dares to hope. There must be a sense of the eternal continuity of a great cause, so that failure will not seem the end and a man sees himself as only a part in a predestined purpose."

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THE DEVELOPMENT OF ROYAL AIR FORCE DOCTRINE

By Air Chief Marshal Sir Robert Brooke-Popham, G.C.V.O., K.C.B., C.M.G., D.S.O., A.F.C.

THE Royal Air Force has only a short history, but this confers the advantage that the whole development of its operational methods and the factors that led to such development are within the memory of those still living. This, if recorded and rightly interpreted, can point the way towards making the best use of air power as new factors come into view. This article is an attempt to trace the development of the offensive policy in air fighting, leaving the task of forecasting the future to those in closer touch with what lies ahead.

Going back to the pre-R.F.C. days, when the expression "I could no more do that than fly" was still common, the main object of the few officers in the Aeroplane Company of the Air Battalion was to prove that aeroplanes could be of real value in war. Their thoughts were concentrated mainly on reconnaissance, including observation of artillery fire, but some felt that the old saying "Advantages in war must be fought for" applied to the air as well as to the land. The first record of this idea is in a lecture given on 3rd November, 1911, at the Staff College, Camberley, by a student who had obtained his pilot's certificate and had been attached to the Air Battalion the previous summer. He said: "A struggle for the command of the air will no doubt be a feature of the next great war. One side is sure to start with an advantage in the numbers or quality of its machines, or in the ability and morale of its pilots, and it is inconceivable that the latter will rest content with a mere exchange of information and not make determined attempts to prevent the enemy doing any reconnaissance whatever . . . the observer may be armed and actual shooting may take place, this would present little difficulty . . . the most rapid machine will have the advantage."[1]

A little later Captain Dickson, the first British officer to fly, who died in 1913 after an aeroplane accident, wrote in a memorandum to a sub-committee of the Committee of Imperial Defence: "The efforts which each side would exert in order to hinder or prevent the enemy from obtaining information would lead to the inevitable result of a war in the air . . . by armed aeroplanes against each other. Their fight for the supremacy of the air in future wars will be of the first and greatest importance."[2]

The early drafts of the R.F.C. Training Manual, Part II, which, though not issued until the end of 1915, was mostly written in 1913, emphasized that it was not by shooting from the ground but only by fighting aircraft with aircraft that decisive results could be obtained, that superior skill and daring would establish a moral ascendancy over enemy pilots, and that there must be no cessation of effort until the enemy was driven out of the air altogether. It also envisaged aeroplanes being armed with guns of larger calibre than machine guns.[3]

In the early days of the R.F.C. knowledge of aerodynamics was still very limited and pilots lacked confidence in technicians and scientists who did not themselves fly. Although calculations could easily prove that firing a rifle or a

[1] *The Army Review*, January, 1912, p. 87.
[2] *The War in the Air*, Vol. I, p. 176.
[3] Training Manual, R.F.C., Part II. Proof No. 7, printed March, 1914; pp. 46-49.

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machine gun from an aeroplane in the air could have no effect on its stability, it was with some degree of nervousness that two officers of No. 3 Squadron went up one morning in a Henri Farman over Salisbury Plain to discover for themselves what happened when a rifle was fired; they were much relieved to find that the effect was nil. In the autumn of 1913 tests were carried out by a flight of the same squadron, in conjunction with the Small Arms School at Hythe, to ascertain the best form of machine gun for use in the air. The Lewis was selected.

Progress was certainly being made for air fighting, but the lack of a close link between the technical and flying personnel retarded the development of an effective fighter aeroplane. As far back as the summer of 1912 a suggestion had been made that it should be possible to design a synchronizing or an interrupting mechanism that would make it possible to fire a machine gun through a propeller without bullets hitting the blades. But pilots were mistrustful, and with some reason feared the risk of burst propellers; the suggestion was not pursued, with the result that the pusher type of aeroplane came to be regarded as the only possible type for a fighter. And so at the start of the Kaiser's war we find a flight of the slowest aircraft in service, the Maurice Farman, detailed for the defence of London. The importance of speed in air fighting had been recognized as far back as 1911, but the fastest machines in 1914 were tractors and intended for reconnaissance in high winds—hence the term "scouts." War quickly proved the necessity for arming these scouts with forward-firing machine guns so that they could be used for fighting. The result of this, as well as arming other tractor aircraft, was a strange variety of improvised gun mountings for firing sideways or upwards clear of the propeller, all of them ineffective. And the Germans were first in the field with an effective specialized fighter. This was the Fokker which appeared in the autumn of 1915. It was a tractor with an interrupter gear which made it possible for the gun to be mounted parallel to the line of flight and accessible to the pilot, the latter requirement being necessary because of the unreliability of machine guns in those days. The lack of close co-operation had another adverse effect. No. 3 Squadron was partly equipped with two-seater Bleriot monoplanes in which the observer sat behind the pilot. The squadron realized that rear defence would be necessary for reconnaissance or observation of artillery fire, so started to experiment with gun mountings for a backward-firing machine gun. But this was stopped because of the risk in carrying out such work without knowledge of the problems involved. The technicians were probably correct in this, but did not realize the practical need for such development. So the R.F.C. had to wait until May, 1916, before starting to get British aeroplanes with the observer behind the pilot and an efficient gun mounting for backward shooting; even then they came out only in small numbers for many months.

One of the first orders issued to squadrons after their arrival in France in August, 1914, was that every aeroplane must go up armed. Although attacking in the air was recognized as the correct policy for individual aircraft, offensive action by several aircraft acting in co-operation, had not been considered. When the Maurice Farman Flight came out to France they were used to protect certain points, e.g., a detraining station. Each aeroplane was to act offensively by attacking any enemy aircraft that approached, but fundamentally the plan was defensive. When scouts were improvised as fighters there were not enough to form a squadron and they were distributed to the corps squadrons for the purpose of stopping enemy reconnaissance by attacking aeroplanes approaching their corps sector of the front. At the Battle of Loos, after the Fokker had appeared, the scouts were used to form a sort of barrage on the enemy's side of the lines with

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the object of holding back the enemy fighters, thus leaving an area in which our artillery aircraft should be free to work. It was only partially successful.

In the late autumn of 1915 meetings took place between General Trenchard and Commandant du Peuty, of the French Air Service, to consider the whole problem of air operations and the new conditions that were arising. Until that time squadrons had been general purpose; even the Vickers Fighter, a pusher that came out to France in July, 1915, was used for reconnaissance and photography as well as in its official role. A big increase in the number of Fokkers had to be anticipated, whilst in the R.F.C. several specialized fighter squadrons were expected, including the D.H.2; this, though a pusher, had a speed of 86 miles per hour, which was high for those days. With Maurice Baring as interpreter, Trenchard and du Peuty thrashed out lessons of the past and problems and possibilities of the future.

It became clear that the barrage system was ineffective because it entailed waiting for the enemy, so left the initiative to him and failed to make full use of the characteristics of aeroplanes. They decided that the object must be to obtain air superiority over the whole battle area, that to obtain this a wider interpretation must be given to the principle of the offensive, and that the correct method was to seek out and attack the enemy aircraft far over their own territory. To carry this out, all fighters should no longer be dispersed but be formed into squadrons and fighter pilots must be trained to work in formation. It will be seen that, although the importance of command of the air was realized as far back as 1911, it was four years before the method of obtaining it was worked out. This development of the offensive policy was first put into execution by du Peuty at the Battle of Verdun early in 1916, and later by General Trenchard at the Battle of the Somme. It proved a conspicuous success and more effective than any barrage in hindering the activities of enemy reconnaissance aircraft. Perhaps the best tribute to it is the fact that, as was shown by a captured document, the German Air Force was ordered to follow suit. As was stated in a pamphlet issued by R.F.C. Headquarters in August, 1917,[4] the Germans "recognized the fact that . . . to win the battle on the ground they must first win the battle in the air[5] and that to win this battle the offensive is essential."

In France it was realized that the air superiority obtained at the Somme was but local and temporary and that it was wrong to talk of command of the air being obtained so long as the enemy sources of supply remained intact. This was made evident in the spring of 1917, when the Germans had better aircraft and used them more effectively. It was only a steadfast adherence to the offensive policy, combined with the gallantry of our pilots and observers, that gave the R.F.C. a fair degree of air superiority over the battlefield of Arras. The air offensive policy may be regarded as reaching its zenith in 1918 in Palestine, when air superiority was obtained not only over a battle area but over the whole theatre of operations. Here it would seem correct to consider command of the air as obtained, because the enemy air force was living on its own fat; Germany was its source of supply and the channel had dried up. In France means for attacking the German aircraft industry were non-existent.

It is worth noting that by 1916 rockets fired from aeroplanes had proved successful against kite balloons and that by 1918 two other developments were

[4] *A Review of the Principles adopted by the Royal Flying Corps since the Battle of the Somme*, p. 2.

[5] Compare *Some Notes on the Use of Air Power in Support of Land Operations* by C.-in-C., 21st Army Group, Holland, December, 1944. Para. 11 (*a*): "It is necessary to win the air battle before embarking on the land battle."

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being tried, viz., additional machine guns mounted on the wings and machine guns of .450 calibre instead of the usual .303; this heavier gun was definitely proving successful. These certainly indicated lines for future development, but none came to fruition until many years later.

Here are five main points that stand out in this story of the air services up to 1918:

(*a*) Development of the offensive policy followed a logical and consistent path.

(*b*) Good ideas are not sufficient in themselves; the method of execution is equally important.

(*c*) The closest touch must be maintained with the technical and scientific world.

(*d*) It is essential to think out the best methods of using or meeting new developments as soon as they come into sight instead of waiting until a crisis has arisen.

(*e*) Much valuable time may be saved by applying lessons of the past instead of having to relearn them.

During the period between the Kaiser's war and Hitler's the doctrine of the offensive was taught at the R.A.F. Staff College and elsewhere. Events of the latter war will remain in the memory of serving officers for many years to come, so a brief reference to a few points will suffice.

First, although the European situation on land forced a strategic defensive upon us in 1940, we followed an offensive policy wherever and whenever possible. Its success was even more marked than in the Kaiser's war, because through it we succeeded in gaining air superiority not only over battle areas but over the whole or a large part of theatres of operations.[6]

Secondly, the long-range, single-seater fighter was a surprising development and it is questionable whether full value was obtained from its potentialities.

Thirdly, it was again shown that the possibility of new technical developments by the enemy makes it very dangerous ever to assume that command of the air is won for good. To ensure retaining it necessitates an unending struggle, with no relaxation on the technical, production or operational side.

Fourthly, the fight for air superiority extended to attack of oil supplies and factories as well as to what may be termed the Battle of Training.

It is outside the scope of this article to discuss the effect that the development of land rockets may have on air operations, but even if our main defence lies in the attack of rocket sites it is open to question whether bombers will be able to carry out the necessary precision bombing unless the air is kept free of enemy fighters.

[6] *Rommel*, by Desmond Young, p. 278. Rommel, referring to the Battle of El Alamein: "The British command of the air was complete."

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DEFENCE AND OFFENCE

By Air Marshal Sir Robert Saundby, K.B.E., C.B., M.C., D.F.C., A.F.C.

THERE are few military matters about which there has been more confusion than the terms "defence" and "offence." On the tactical level there is not much difficulty, because the distinction, though perhaps not easy to define theoretically, is easy to recognize in practice. But on the strategic plane it seems to be more difficult to separate the two phases.

I have met professional warriors who could not see that if Bomber Command were engaged in hunting and attacking submarines in aid of the Battle of the Atlantic it was acting defensively; but if it were attacking German war industries it was acting offensively.

So let us take this simple example, and briefly analyse it.

If Bomber Command were employed against the enemy's submarines its object was to destroy them, in order to safeguard our sea communications. The function of our sea communications was to enable us, first, to import essential food, raw materials and oil fuel, and, secondly, to supply our forces overseas.

But secure sea communications were a *sine qua non* of our existence, and not, from any point of view, a means of winning the war. In fact, if we had to devote all our resources to the achievement of security at sea, we should be committed to a wholly defensive attitude, and our eventual defeat would be certain.

Strategically, therefore, in the Battle of the Atlantic, Germany was on the offensive and we were on the defensive.

On the other hand, when Bomber Command was attacking German war industries and communications it was attempting to destroy German capacity to make war. If it succeeded the enemy's war material would be insufficient to support his offensive war plan, which would therefore fail. He would be compelled to devote a great part, perhaps almost the whole, of his air forces to the defence of his homeland. He would thus lose the initiative in the air and, consequently, on land also.

The strategic bombing campaign against Germany was, therefore, a powerful contribution towards winning the war; the Allies were on the offensive and the Germans on the defensive.

Now it is a cardinal principle of war that maximum force should be concentrated in the offensive, from which it follows that minimum force should be allocated to the defensive. It is in this connection, if in any, that the oft-quoted phrase "offence is the best form of defence" has any meaning. But the matter is by no means as simple as that.

Obedience to this principle in the past has led to an unreasoning distrust of the defensive attitude. In fact, a correct appreciation of when to stand on the defensive, if necessary with all your forces, and let the enemy wear himself out in the attack, and when to resume the offensive, is a great part of the art of generalship.

A classic example of this, because, owing to geographical conditions, it has been unchanging, is the traditional strategy of Russia. When Russia is invaded her object is to fight delaying actions, avoid encirclement, and withdraw into the vastness of her hinterland, and there to bog down her enemy by the immense length of the front and of its communications. This Russia did in 1941-42, standing on the defensive at three places only—before Leningrad, before Moscow and before Stalingrad.

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When the combined effect of huge distances, partisan interference with communications and, last but not least, the Allied strategic bombing campaign, had reduced Germany to the required degree, the Russians were able to resume the offensive. Germany was unable to withstand even a small degree of pressure at the front, and had to withdraw. Retreat increased her losses of material, and thus made her shortages even more acute. She therefore failed to reap the benefit of a shortened front and lines of communication, and was unable at any point to halt her retreat. She was forced on to a strategic defensive from which she had no hope of escape, and which ended in her defeat.

The moral is that if a defensive phase is chosen for good reasons, to bring about a situation in which it will be possible to resume the offensive with good hope of success, it is sound and, indeed, by conserving strength, it may well shorten the road to victory. If, however, it is forced upon a belligerent, as a result for example of the failure of an offensive, then it is bad, for it may prove impossible to bring the defensive phase to an end.

In the first case, the defensive attitude is deliberately chosen, and there is no loss of initiative. In the second, it is loss of the initiative which forces the belligerent to adopt the defensive.

What is fatal, therefore, is loss of the initiative, and not the adoption, for good reasons, of a defensive attitude. Note how in the last war, when the Battle of Britain brought to an end the opening defensive phase, we seized and kept the initiative in the air.

As we shall never be the aggressor, it is certain, in any future war, that we shall have to meet, at the outset, the shock of an attempt to destroy us by a sudden and overwhelming blow. All our resources, including our air striking force, will have to be concentrated on the task of breaking up the enemy's attacks, upon us and our allies, with the most punishing losses. If we can do this the enemy will find that his offensive plan, on which he has staked so much, has failed and he is liable to falter, considering what next to do. Now is our opportunity to seize the initiative and change over to the offensive. There is a good chance that, once we have obtained the initiative, we can keep it, and in due course deploy our forces, with those of our allies, for the grand offensive campaign which alone can lead to victory.

If this is true, should we not plan in peace time in accordance with these ideas? We shall not be allowed to get away with another Norway or Dunkirk.

We are vulnerable in two ways to the knock-out blow—quickly from the air, and more slowly by strangulation of our sea communications. We must therefore be ready for immediate defensive action in the air, including the operations of our air striking force; and we must be able to organize the security of our sea communications within a reasonable time.

An expeditionary force on land is not required in the early stages,* but will certainly be needed later as part of the final offensive campaign. In the first phase, however, I believe the role of the Army should be to support the air defence of this country. This it can do in three ways: by manning the anti-aircraft defences, by guarding really vital points from airborne attack, and by assisting the civil authorities, in a score of ways, to solve the problems created by large-scale air attack.

In a brief article such as this I cannot do more than give the outline of a few ideas, but perhaps I have said enough to stimulate thought on these very important questions of policy.

*See Chapter X, *War in Three Dimensions*, by Kingston McCloughry. (Jonathan Cape.)

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THE GHOST OF DOUHET

By J. M. Spaight, C.B., C.B.E.

GIULIO DOUHET, dead and gone these twenty years, still haunts a world in which the air power of his dreams has gone on living and growing to a stature that would have been an amazement even to him. (What place have his 50-kilogramme bombs in the armouries today?) They are museum pieces, the aircraft and the weapons of his day, but some of his ideas are still alive. His hand was to be felt moving in the darkness behind many of the scenes of the great war which he did not live to see. It was a red hand. It did not work for righteousness.

He was the apostle of frightfulness in the air. He made no bones about it. The war of his vision would be "an inhuman, an atrocious performance." It would spread terror through the enemy nation by striking at the great centres of population and thus by "direct action" would break down all material and moral resistance. He foresaw "panic-stricken people fleeing to the open country-side to escape the terror from the air." "The time would come when, to put an end to horror and suffering, the people themselves, driven by the instinct of self-preservation, would rise up and demand an end of the war." It would be a war without discrimination or mercy. "The limitations applied to the so-called inhuman and atrocious means of war are nothing but demagogic hypocrisies." "Poison gas will be largely used in the war of the future." (*The Command of the Air*, translated by Dino Ferrari, New York, 1942; pp. 57, 58, 181 and 185.)

It is not a pretty creed. It is one from which civilized society will immediately recoil. It was never of a nature to commend itself to responsible statesmen. In the House of Commons on 21st June, 1938, Mr. Neville Chamberlain, the Prime Minister, showed how repugnant such a doctrine of "direct action" is to our way of thought. He said: "We cannot too strongly condemn any declaration on the part of anybody, wherever it may be made or on whatever side it may be made, that it should be part of a deliberate policy to try to win a war by demoralizing the civilian population through a process of bombing from the air. That is absolutely contrary to international law." Nor was it the policy of the country with which we were to find ourselves at war a year or so later.

Goering and his air force may have played with the fringe of the idea, but Hitler would have none of it, and it was Hitler who for twelve years dictated policy in Germany. Let us give the devil his due. In this matter he was on the side of the angels: it happened to be the side that suited Germany and her great army. There is a good deal of evidence that he set his face against terrorization. "Terror raids by the Luftwaffe have small value and accomplish little," he said at a conference of his advisers on 8th/9th January, 1941 (A. Martienssen: *Hitler and his Admirals*, 1948; p. 100). At an earlier conference on 14th September, 1940, he had stated that deliberate attacks on residential areas were to be reserved "as a final means of pressure and as a reprisal for British attacks of this nature" (ibid., p. 88). There is a passage, too, in General Jodl's testimony at Nuremberg which is worthy of attention. It was the more significant because it was not in Jodl's interest to whitewash Hitler, yet he stated definitely and without challenge that Hitler was always opposed to "air war against the population." He did his utmost to avoid it, Jodl claimed, and it was not he who began it (*Trial of German Major War Criminals*; H.M.S.O., 1948; Part 15; p. 422).

"What!" a reader may exclaim. "Not begin it? What about Warsaw and

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Rotterdam? Did not Hitler deal with these towns in the Douhet way?" The reply is that neither at Warsaw nor at Rotterdam was the bombing strategic—that is, it was not the kind of bombing which Douhet contemplated. It was tactical and designed to compel the surrender of the garrison holding the town; whereas no question of the capture of a defended place arises in strategic bombing. The bombardments of Warsaw and Rotterdam were, in fact, relics of an older, pre-Douhet, practice of war. They were closely akin, for example, to some bombardments of the Franco-German War of 1870-71.

In that war the city of Strasbourg was pounded by German guns for weeks on end. When the first parallel was opened and regular siege operations were begun, General von Werder directed his artillery to shell the works by day and *the town by night*. The German official history of the war was quite candid about the reason. It said: "A serious cannonade from the siege batteries upon the closely built town, sparingly provided as it was known to be with bomb-proof shelters, would overawe to a considerable degree the less trustworthy parts of the garrison, and would probably induce the inhabitants to compel the governor to surrender the fortress" (German official *History*, Part I, Vol. II; p. 446). The result was that about three-quarters of all the private houses in the town were destroyed or damaged, 10,000 people were made homeless, and 1,700 civilians killed or wounded. The public buildings fared badly. The famous Library was wrecked and 400,000 volumes and 2,400 manuscripts, many of them priceless, were destroyed by the German cannon. "Since the apocryphal burning of the library of Alexandria," says the British military historian Sir Henry Hozier (*The Franco-Prussian War*, Vol. II; p. 71), "perhaps no equally irreparable loss has occurred." The beautiful cathedral was badly damaged, too.

Other French towns were also shelled indiscriminately in that war. At Soissons far more damage was wrought in the town than in the defences. At Longwy all the public buildings were destroyed and nearly every house was damaged. At Péronne, "when half the houses had been demolished, the commandant, after a twelve days' bombardment, which had injured neither the walls nor the guns nor the soldiers in the garrison, gave in" (Sutherland Edwards: *The Germans in France*; p. 183). In Paris the Invalides, the Sorbonne, the Panthéon, the School of Law and the Garden of Medical Botany suffered severe damage. In various towns churches were demolished by shell fire.

The losses referred to above were trivial in comparison with those caused by bombing in 1939-45. True, but the artillerists did their best—or worst—with the weapons available, and it is the principle involved that matters. The practice of war allowed the bombardment of a defended town in *all* its parts. It was recognized, with reluctance, by jurists; W. E. Hall referred to it in his great work on *International Law* (Section 186) as "a measure of peculiar cruelty," but added that "for the present it is sanctioned by usage, and it was largely resorted to during the Franco-German War of 1870." It will probably always be resorted to when a defended town resists attempts to capture it. What is new and deplorable is the extension to strategic bombardment of a practice that was applicable only to tactical operations. So extended, the practice is freed from the natural limitations imposed upon it by the circumstances in which tactical attack is possible and becomes a menace to every town, however far removed from the theatre of land or naval operations. In what degree the extension has been due to the abiding influence of Douhet is not easy to determine.

He has been branded by a distinguished military writer, Major-General J. F. C. Fuller, in his *History of the Second World War*, as the true author of the "unstrategic" bombing, of which there were numerous instances, General Fuller

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states, in the late war. He has explained more precisely what he means by this term in an article in an American military journal (*Ordnance*, September-October, 1949). Broadly, he means by it bombing designed to terrorize the enemy nation into submission, more particularly by means of undiscriminating attacks on centres of population. His argument is that "Not only is physical war dependent on industrial power and city life, but our civilization is also dependent on them. Destroy the factories, and the cities become shells; destroy the cities, and the wheels of industry cease to turn. Destroy both, and civilization reverts to barbarism." Instead of striking at the cities an air force should concentrate, he holds, on "the sources of industrial and military energy and the means of industrial and military movement. In other words—coal, oil and transportation." What he says certainly seems to receive corroboration from the reports of the United States Strategic Bombing Survey; but he goes too far in condemning all attacks on cities (see later), and he is not always accurate in his facts. In the article in question he takes the United States Air Force to task for the "obliteration" of Hildesheim, "one of the most perfect examples of medieval towns in Europe and possessing no military significance (the railway junction is outside the town)." But the raid which wrecked Hildesheim—there was only one—was a British one. It was a daylight raid, on 22nd March, 1945, and there was a Mustang escort, which may have led to the misunderstanding, but undoubtedly the bombers were Lancasters.

Another example which the General gives in his article of a town subjected to "unstrategic" bombing is Dresden. It was attacked twice on the night of 13th February, 1945, by separate all-Lancaster forces and again by American bombers on 14th February. It was terribly mangled, most of the destruction being caused by the first Lancaster attack. The damage was largely due to fire; 650,000 4-pound incendiary bombs were dropped in the city, as well as hundreds of 4,000-pound bombs and some 8,000-pound. They were dropped in the centre of the city, in the Altstadt, the area in which stood the famous Zwinger Museum, the Opera House, the Frauenkirche, the Dreikönigskirche, the Schloss and other beautiful buildings. All went up flames. The heart of Dresden was burnt out. Twenty-seven thousand houses and 7,000 public buildings were destroyed, and more than 20,000 people killed. The death roll was swollen by reason of the presence in the city of refugees from Eastern Saxony, who had fled before the Russian invasion. The official reasons given for the raid—that it was an important industrial town and the centre of the railway network serving the German armies facing Marshal Koniev's Soviet forces—would have carried more conviction if the factory quarter and the railways had been the aiming points, but they were not. The factory district is in the suburb of Plauen, well to the west of the city, and the Hauptbahnhof is nearly a mile to the south of the centre of attack. Incidentally, was it in the long view good strategy to help the Russians to bite more deeply into Germany?

It is a sad story, Dresden, but it is not the whole story. Take another city, one comparable in size to Dresden (each had about 650,000 inhabitants), but in all other respects utterly unlike it: Essen. While Dresden was practically defenceless, Essen was one of the most powerfully defended fortresses in Europe. It was truly a fortress, a *place d'armes*. And it was, for an enemy, the most dangerous industrial town in Europe. It was, more than any other, the centre and source of German armament. Here, again, the bombs went down in the heart of the town, but the heart here happened to be the Gussstahlfabrik Friedrich Krupp, not the baroque Altmarkt of the splendid Saxon city. That was what made the difference. Krupps was Essen and Essen was Krupps. They could not be disentangled.

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Colonies for Krupps's employees were scattered here and there throughout the town. If ever there was a town the bombing of which was justified militarily it was Essen. We need not be afraid to have *that* city's skeleton taken out of our cupboard. To describe such bombing as "unstrategic" is surely an abuse of terms. To say that if our civilization is to be preserved the Essens of the world must be spared is to come very close to talking nonsense.

Essen was not unique. Its relation to Krupps was not very much different from that of Düsseldorf to Rheinmetall Borsig, or Duisburg-Hamborn to the August Thyssen-Vereignigte Stahlwerke, or Oberhausen to the Gutehoffnungshütte, or Bochum to the Bochumverein, or Ludwigshafen to the I.G. Farbeindustrie, or Russelheim to the Opel engine works, or various other towns that could be named to big industrial concerns in whose plants wheels turned and hammers rose and fell without ceasing to serve the needs of Germany's war machine. It is in such cities that battle begins, the prefabricated battle of which the first shots are fired in the workshops.

The German towns which were attacked varied from Essen at one end of the scale to Dresden at the other. To assume that they were all of like character, to discuss the bombing of them in general terms and without differentiating between those whose activities were lethal and those that were comparatively innocuous, is to over-simplify an inherently complex question. The towns that were studded with war industries were sound strategic objectives. Logically, that must be so. If bombing is admitted to be strategic when it is directed against an oil plant or a railway junction, it is so, presumably, because it keeps out of the line of battle munitions (or reinforcements) which would otherwise be there. Why, then, is it not strategic to achieve the same result by preventing the munitions from being made, or, alternatively, why should it cease to be strategic if the factory making them is an urban one? It may be that it would be better policy to attack *movement* rather than *production*, but it does not follow that the attack on production is not strategic. That is a question of priority of targets, not of fundamentals. The attack on a military objective such as a war factory would cease to qualify as a strategic one only if it were made the excuse for ranging far beyond the locale of the objective and resorting to widespread devastation for the purpose of undermining the morale of the citizens, the general public or, in Douhet's own words, "to hammer the nation itself to make it give in" (*Command of the Air*; p. 201).

Attack on morale is not in all circumstances to be condemned. To "terrorize" the war workers so that they desert their benches or forges or assembly lines is a perfectly legitimate act. The morale of such workers might be said, indeed, to be itself a military objective. It is a totally different matter to attack the morale of the civil population as a whole, to try to bludgeon it into defeatism by wholesale and undiscriminating massacre and destruction. That is a way of war which is far older than Douhet. It was the way of Genghis Khan and Timurlane.

It was perhaps fortunate in some respects that, as a morale-breaker, bombing was not particularly effective in the Second World War. There were no such panic-stricken evacuations of cities as Douhet had foretold, though the attacks were on a far greater scale than he had foreseen. The urban population stood up to their ordeal with unexpected fortitude. Cities proved themselves to be exceedingly tough. Hamburg, which was subjected to some terribly destructive attacks at the end of July, 1943, had recovered 80 per cent. of its former productivity in five months (United States Strategic Bombing Survey, *Over-all Report (European War)*; p. 73). The forecast of a whole people arising in its wrath to force

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its government to make peace and thus to end the terror from the air was far removed from reality.

Douhet can be imagined playing his last hand not long before the war came to an end. The atomic bomb was being made in America. It combined in itself the explosive, incendiary and toxic qualities which he held that the ideal air attack should possess, in the form, he thought, of separate bombs dropped in series. Fate intended the bomb, one feels, for use not against one of the main islands of Japan but against two small stepping-stone islands which were, in the event, the scenes of the bloodiest fighting of the Pacific war. It would have crushed the opposition in them at a blow. But the bombs were late and before they were ready the islands were taken, one of them on 14th March, 1945, and the other on 21st June. Then one can fancy that Douhet seized his opportunity. He saw the possibility of his vision of ripped and gutted cities coming true. He contrived that the names written on the two bombs—there were only two in existence—should be changed. Hiroshima and Nagasaki were substituted for the original Iwo Jima and Okinawa. So the curtain went up for the grim tragedy in Kyushu. Was there a ghostly chuckle of satisfaction in the wings, or was the magnitude of the disaster too great for that?

COVER PICTURE

No! This is not **the atomic bomb but only the Royal Canadian Air Force's latest aerial camera. For a full description of the work carried out by the R.C.A.F.'s photographic reconnaissance squadrons turn to "Our Commonwealth Air Forces, page 179.**

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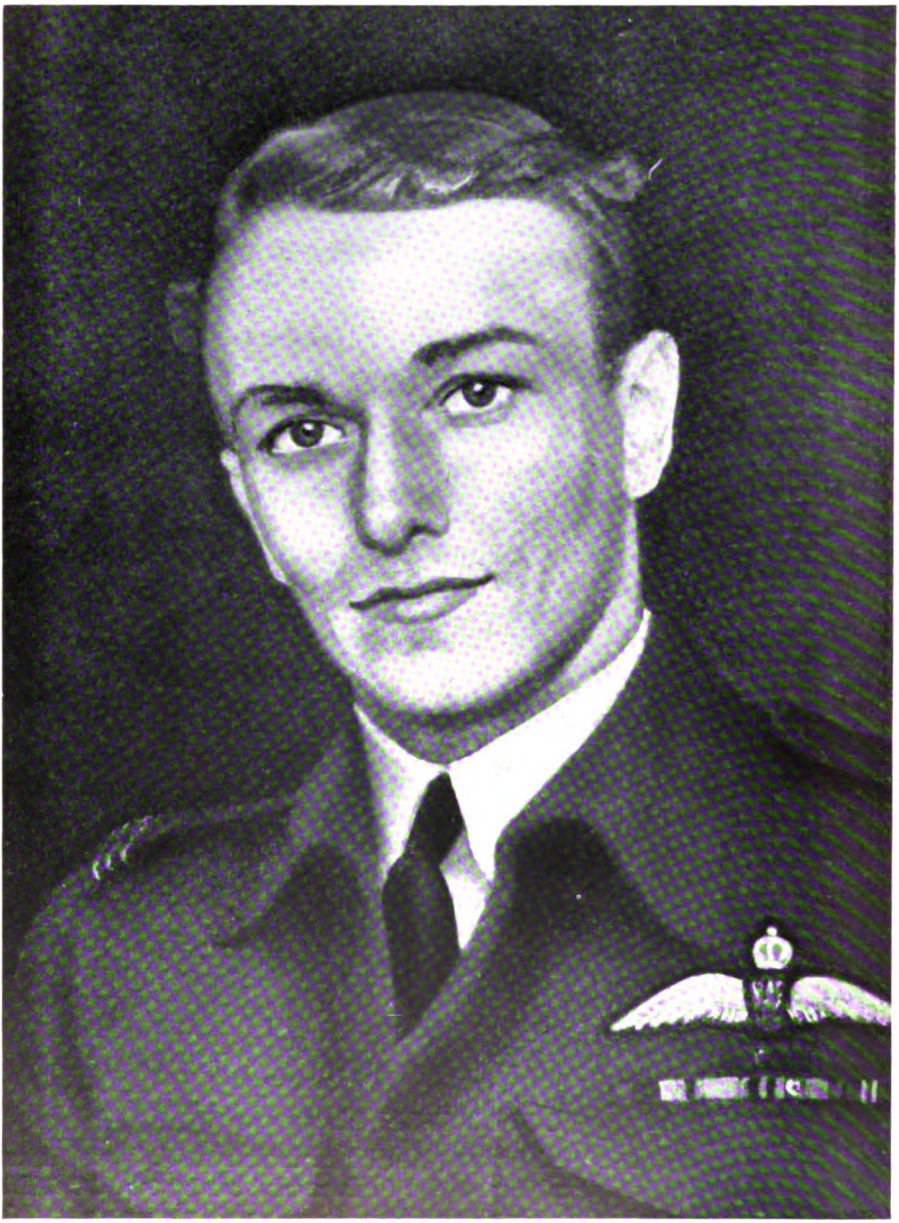

[Air Ministry Photo

Wing Commander Hugh Gordon Malcolm, V.C.

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V.Cs. OF THE AIR

WING COMMANDER HUGH GORDON MALCOLM, V.C.

By Kenneth Hare-Scott

HUGH MALCOLM, born on 2nd May, 1917, at Broughty Ferry, Dundee, where his parents live today, was the eldest of three children, the only boy. His childhood and school days followed closely the pattern of every normal boy; he got on well with his contemporaries, was fond of sport, worked hard enough to get good reports, but not too good, and in the holidays let himself go at his favourite hobbies, pottering with motor-cars and their engines, hunting, fishing, and in later years golf. His mother remembers that even during his early school days he had set his heart on joining the R.A.F., and at no time did another career receive serious consideration. His youth was spent against the background of his native Scotland; from Craigflower Preparatory School at Dunfermline he went to Trinity College, Glenalmond, one of Scotland's proudest public schools whose sons have won immortal fame in Britain's battles. His quick, alert brain enabled him to move comfortably through his school days. Undistinguished at work or games—he was the average boy, happy in his surroundings and with a facility for making friends. During his holidays he met a little girl, Helen Don-Swan, who some years later was to become his wife.

In January, 1936, Europe speculated uneasily upon Mussolini's mischief in Abyssinia; Hitler built the Olympic Stadium in Berlin for the great pageant of the Olympic Games—an occasion when all the world might see and take note of the new Germany. In that month Hugh Malcolm went to Cranwell, and entered with zest upon the first phase of achieving his ambition to be an airman. The Royal Air Force College, founded in the headquarters of the old R.N.A.S. station by Marshal of the Royal Air Force Lord Trenchard in 1920, came into its own in 1934 when the Prince of Wales opened the imposing building which dominates the level countryside near Sleaford. Cranwell had then taken its place in importance with the Sandhurst and Woolwich of the thirties. Two entries a year, each of about thirty flight cadets, doing a course which lasted two years, gave the College a total of about 120 cadets during Malcolm's term, which he spent in "C" Squadron. Air Vice-Marshals Cave-Brown-Cave and Baldwin successively reigned as Commandant. By 1938 the number of entries to Cranwell had risen to three, bringing the average attendance to around 180. After a break during the war years in its original purpose of training flight cadets for permanent commissions, the College has today resumed its important role in Britain's defence, enlarged to accommodate 240 cadets taking a course lasting two years and eight months.

Malcolm as a cadet had one apparent disadvantage. A Cranwell contemporary says: "He was a keen horseman, and he was an active member of the Riding Club after it was formed. Before that he used to hunt with the College Beagles. He bought a horse while he was a cadet, which he used to hunt, and he also rode it in an R.A.F. race in the 1938 Blankney Point-to-Point.

"He liked driving fast either in a car or on a motor-bike, and he used to be a great help in organizing the trials and hill-climbs which were allowed then.

"He was not a great athlete, but he played in the inter-squadron rugger games.

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In the summer he played tennis and he used to go to Newark for rowing and swimming; he went to watch all the car racing at Donnington and Syston, and the racing at Lincoln.

"He was a most likeable person, with great courage. He liked doing things which were slightly dangerous. The rugger and cricket tradition was very strong then and these were not his strong points. He would inevitably have been a success once he was away from that influence."

He achieved no promotion during his cadetship, but it is recorded that he was librarian at the time when he left in December, 1937, to take a permanent commission as a pilot officer.

From the Army Co-operation School at Old Sarum he was posted to No. 26 Squadron at Catterick, and was more frequently able to travel north—to home, fishing and riding. In May, 1939, he very nearly lost his life when he crashed in a Westland Lysander aircraft at the Empire Air Display, near Manchester. His limp body was carried from the wreckage with a fearful gash in his head. A major operation saved him, but he himself dismally forecast his flying future in a remark to Nurse Helen Don-Swan, who by chance had come into his life again at the hospital at Halton: "I will never fly again." At first it did not look as though he would, but after a period of being "grounded" his determination won the day and he was in the air by the end of 1940, the year in which he and Miss Don-Swan were married.

Promoted a flight lieutenant in September, 1940, he became squadron leader in December, 1941, and wing commander nine months later. Promotion came quickly in the early war years, particularly to the Cranwell cadets of the 1930's, whose early training and experience provided the nucleus around which British and American airmen gathered to form the greatest air striking force the world has seen in modern conflict. Malcolm's growing reputation was as a bomber pilot; with navigation skill above average and an unusual capacity for leadership (a vague term which in war time means inspiring confidence in others, being bold but not reckless, mature and not impulsive), he became by the end of 1942 an officer of great promise in his Service.

In November of that year he was commanding a squadron of light bombers in North Africa, where the Allied land forces from east (the Eighth Army) and west (the First Army) were driving Rommel's desert army in final retreat from the African Continent, which it so coveted, thereby opening the gates for the ultimate liberation of Europe and the defeat of our enemies. His squadron, No. 18, was busy. On 17th November, 1942, he was told to carry out a low-level bombing attack on Bizerta airfield, *taking advantage of cloud cover*. Twenty miles from the target the sky became clear. Undeterred, he carried on, knowing well the danger of the changed weather conditions, particularly without fighter escort. Despite fierce opposition, all bombs were dropped within the airfield perimeter. A Junkers 52 and a Messerschmitt 109 were shot down; many dispersed enemy aircraft were raked by machine-gun fire. Rapidly the weather conditions became more and more unfavourable, and, as a result, two of his aircraft were lost by collision; another was forced down by enemy fighters. Owing to his skilful and resolute leadership the remaining aircraft safely reached their base.

Ten days later he led his squadron again over Bizerta airfield, bombing it from a low altitude. The airfield was heavily defended and intense and accurate anti-aircraft fire greeted the raiders. When his squadron had released their bombs, Malcolm challenged the fierce opposition several times by attacking the airfield with machine-gun fire.

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These attacks were typical of the man; each action he fought until absolutely convinced that his squadron could do no more damage. Formidable opposition made no difference: except to encourage him to make so sure of success that there would be no need for another visit.

Wing Commander Malcolm, V.C.

On 4th December, 1942, his squadron of ten Bisley light bombers received what was to be its last command—to give close support to the First Army in Algiers by attacking the enemy fighter airfield near Cheuigui. In the words of the official citation: "Wing Commander Malcolm knew that to attack such an objective without a fighter escort—which could not be arranged in the time available—would be to court almost certain disaster; but, believing the attack to be necessary for the success of the Army's operations, his duty was clear. He decided to attack." He had done it before. With luck they might succeed, and in any case the state of the battle demanded such a hazard on the part of the R.A.F. They set off, the "doomed squadron" according to contemporary reports, and reached the target unmolested. Their bombs went down, and then an overwhelming force of enemy fighters dived upon them. Here is an eye-witness account by one of the very few survivors of what followed: "Our bombs were still going down when fifty to sixty Messerschmitt fighters came in at us. In the tightest possible formation we weaved as a single formation through valleys and hills. We could see the fighters' cannon shell bursting all along the mountainsides on a level with our faces. Finally we were forced out of formation and, with the starboard engine on fire, the fuselage on fire, and a large piece of wing missing, our plane went into a hillside at almost 150 miles an hour. Out of the blazing aircraft all three of us emerged more or less in one piece, and as we were in no-man's-land we began to run like hell. Behind us were a party of men rushing down a hillside and ahead was a second party of men, our own troops, coming to meet us. We were accelerated by cannon shell from an enemy fighter who was trying to get us, but we made it."

Malcolm was not so lucky. He had done his utmost to maintain formation, but one by one the machines of his squadron were shot down, until only his remained. A minute or so later shells tore into the aircraft, which went down in flames. All aboard perished. The award of his posthumous V.C. was announced in April, 1943, for successive feats of daring which, inflicting heavy damage upon the enemy, had culminated in the last suicidal but splendid epic.

The memory of Hugh Malcolm is with all who fly or serve with the R.A.F. at home and abroad. Described by his mother as an "ordinary, straightforward boy about whom there was nothing to suggest that he would win a V.C.," Malcolm has given a name to R.A.F. clubs everywhere. In 1943 Lady Tedder opened the

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first Malcolmn Club for R.A.F. other ranks in Algiers. That was the beginning.

Two years later, when many clubs were in existence, Lord Tedder opened the first Malcolm Club in Germany, near Osnabruck, to serve 2,000 airmen who had taken over former Luftwaffe airfields in the district. Ten days earlier the site of the club had contained only the ruins of much-bombed Luftwaffe huts, and the ground was studded with unexploded mines and booby-traps. Reading and writing rooms, rest rooms, a games room, a library with more than 5,000 books, shower-baths and a canteen with first-class snack meals, beer and a soda fountain had sprung into being. A regular programme of entertainment was planned in the concert hall. Forty Russian girls rescued from a slave-labour camp at Osnabruck formed the canteen staff under the direction of Mademoiselle Monique Nijaki, a French girl who had been interned for three years.

Today there are some fifty Malcolm Clubs in all parts of the world.

The other day I visited Cranwell to lecture. The occasion was a guest night with the attendant ceremonial well known to all past cadets of the College. My ordeal over, and in spite of the late hour, my host, Wing Commander Fulton, led me round the gallery of Cranwell's heroes—photographs of the earlier ones and pastel drawings of those of the last war. The immense contribution of the R.A.F. College to our defeat of Goering's Luftwaffe came home in a glance along the ranks of fighter aces—the men who turned the tide which threatened to destroy our island, and in due time Western civilization itself, in that fateful September of 1940. Then came the mounting counter-offensive when the bombers roared by night, and then by day, across our homes and over the Channel to blast Hitler's Fortress Europe. These heroes, too, adorn the walls of Cranwell, and among them in a position of special honour to the left of the main entrance hangs the portrait of Hugh Malcolm, of which a reproduction illustrates this article.

A friend of mine who knew Malcolm for some years describes him as typical of the best of our breed. Charming because by nature he could not help it, refreshing in his enthusiasm for sport and all that life offered, and serious only when he heard of someone else's troubles, he was a selfless soul whose qualities were bound to inspire his contemporaries—in battle and in peace.

I have studied many citations which won V.Cs. of the Air; the story of Hugh Malcolm, Cranwell's V.C., the ordinary fellow in whom the sense of duty reigned supreme, will live as long as deeds of valour are told among men.

A CORRECTION

On page 6 of the January, 1950, number of THE ROYAL AIR FORCE QUARTERLY was a photograph of four members of the Air Council. According to the caption the officer on the extreme left of the picture was alleged to be Air Marshal Sir Victor Goddard, but it was in fact Air Marshal Sir Arthur P. M. Sanders. The error is regretted and we offer our humble apology for our failure to correct the page proofs.

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LIFE ON A FIGHTER STATION

By Group Captain K. B. B. Cross, C.B.E., D.S.O., D.F.C.

THE continuing unsettled international situation imparts a strong impetus to the need in the United Kingdom for a powerful air defence force. The force in being must be able to withstand without reinforcement the whole weight of the initial air attacks. These attacks, carrying the terrible destructive power of atomic, bacteriological and modern high-explosive bombs, must be nullified if this country is to survive.

These unassailable facts give to life on a fighter station a unique flavour of urgency not to be found elsewhere. As the public is not unaware of the existence of the threat to our security, there is always pressure on the Government of the day for a more powerful and efficient fighter force. The direct result of this is that the front-line fighter squadrons are equipped with the most up-to-date aircraft in the Royal Air Force. Note how the Hurricane and the Spitfire preceded the Halifax and the Lancaster, and compare the Meteor and the Vampire with the aircraft of other R.A.F. commands.

Add Fighter Command's commitments in the way of training the fighter squadrons and the Fighter Control units of the Royal Auxiliary Air Force, bearing in mind the facts that all stations shoulder a part of the responsibility and that the training is done mostly at week-ends; then the atmosphere of grim earnest is complete. The need for all-day-and-every-day efficiency comes home forcibly to all ranks.

Fighter Command's task is the defence of the United Kingdom and its coastal shipping from air attack. The threat to be met can only come, as always, from across the sea. Fighter stations, therefore, inevitably form a defensive crust around the island. Pleasant stations all of them. With such points in their favour, and equipped as they are with every modern aircraft, they tend to arouse a sentiment, amounting at times to a strong affection, in many of those who serve on them. One has only to count the names of fighter stations which have become Service bywords for proof of this.

A typical fighter station conveys immediately to the visitor its quality of activity. The whole station is busy—a shimmering pattern of noises dominated by the banshee moan of the jet engines at first hearing, strange and a little unsettling. The bustle is not deceptive; man power is the key, and there is no place in the organization for men not prepared to give generously of their spare time to the running of the station.

A normal day on a fighter station starts with a working parade at eight. By the time that the parade dismisses ten minutes later the hangar doors have been opened by duty crews from each squadron. As the aircraft are being pushed out the pilots assemble in the wing briefing room for weather briefing. This is given by a pilot whose assumptions and forecast of the weather are then commented on by the meteorological officer. The first sorties are airborne within a few minutes of met. briefing; and flying then continues throughout the day until five, followed about two evenings per week in the winter by night flying up to about 10 p.m.

This flying is directed towards the production of a uniformly high standard of ability in the pilots. A day-fighter pilot must be able to fly his aircraft as second nature. If he has to pause in flight for an instant to calculate the possi-

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[Air Ministry Photo

A Meteor II being scrambled

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bility of a manœuvre, or to ponder the intricacies of the cockpit layout, he has not attained the standard. He must be able to fly in any position in a close or battle formation, and fly well in that position. Only in that way can a formation of fighters be manœuvred with confidence and decision by their leader. There is a close affinity between the evolutions of a fighter formation and the well-drilled, compact bodies of red-coated troops who executed their barrack-square movements with precision on the battlefields of Europe in an age before the advent of aeroplanes.

Our pilots must be able to take off and land in bad-weather conditions by day, or by night, when this becomes an even more vital necessity. Blind-bombing devices and landing aids carried in modern bombers make the bad-weather threat a real one. The pilot must know his sector thoroughly as he knows the palm of his hand. A "pin-point" in time in bad weather may make all the difference, with the short endurance of jet fighters.

The need for accurate and speedy ground control of interceptions has been intensified by the speed of modern bombers, and the short "warning period" which is a result of that speed. A missed interception will leave the defence poor hopes of a second chance before the attackers reach their target. Consequently the ground controllers and the fighter pilots must form a closely knit team, capable of positive and accurate interception. This necessitates, on the part of the pilot, a complete understanding of the problems of the ground controllers and of the means at their disposal for the execution of their task. Arising out of such an understanding will be his responsibility to act instantly on orders from the controllers. In spite of their concerted efforts, it may not always be possible for the ground-air team to effect an accurate interception. It is extremely unlikely, however, that the fighters will not at least be directed to the area in which the attacking forces are to be found, and so the pilot must be able to see and recognize the enemy at extreme ranges. This is, of course, dependent on good eyesight, but also to a surprising extent on skill in searching acquired by training and practice.

Finally, when the labours of the whole of a station place the fighter in position for an attack; when the lives of many people out of sight and beyond earshot depend on the destruction of a bomber—then there must be no mistake. The bomber must be hit, and hit in a vulnerable spot which may be only a fraction of its armoured bulk. So last, but not least, the pilot must be able to shoot steadily and accurately. Here again, for reasons which would require a complete article to themselves, there may be no second chance; the first attack may be the last.

The training to produce pilots of this calibre is of absorbing interest. From experience on type the training is progressive. Formation flying and camera-gun exercises form a large section of the early syllabus, as these have to be mastered before the pilot can be considered operational and of any use to the squadron.

A feature of present-day training is the constant and by now semi-permanent affiliation with the U.S.A.F. bomber groups stationed in the United Kingdom. Day by day these take the form of single B29's, or small formations, flying in the sector area. The fighter squadrons practise attacks upon them whilst the American crews perfect their defensive gunnery, using the fighters as targets. Ciné films are exposed on all sorties, and when assessed by the respective weapons officers they are exchanged and tactics are discussed by the fighters and bomber squadrons concerned.

Approximately once each fortnight a large-scale exercise is carried out. On these occasions forces of bombers fly on a route passing through all the Fighter Command sectors. The fighter wing, with the pilots waiting in the cockpits of

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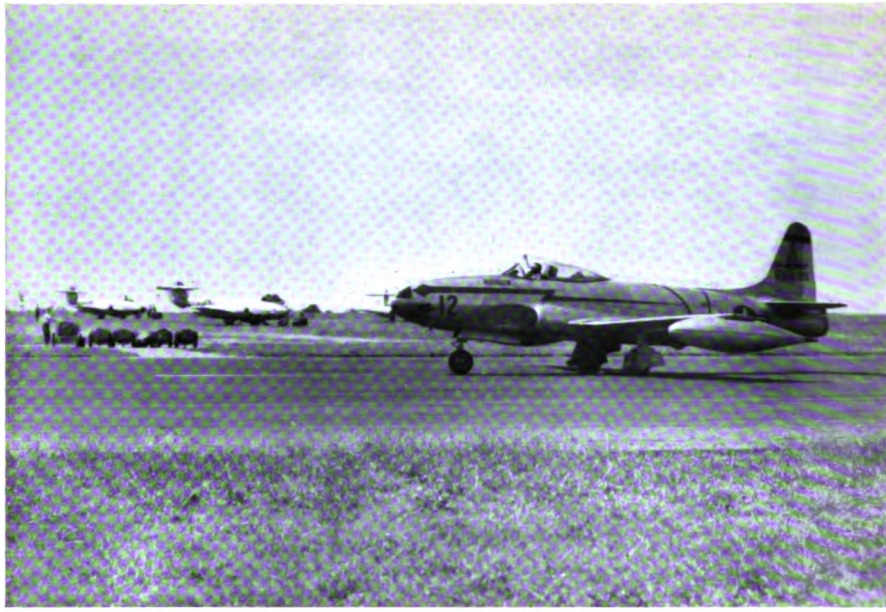

[*Air Ministry Photo*

A visiting Shooting Star of the U.S.A.F. taxis up the runway, passing R.A.F. Meteors in the background

[*Air Ministry Photo*

A visit by the Prime Minister to a Fighter Command station. ***He is seen talking to L.A.C. Bull. In the foreground is Flight Sergeant J. Duncan of No. 245 Squadron. On*** *the extreme right is the author of this article, accompanied by Flight* ***Lieutenant R. F.*** *Jones, of the Aircraft Servicing Squadron*

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their aircraft either at dispersals or on the end of the runway, are alerted and scrambled to intercept the bomber force as it enters the sector. These exercises are among the high-lights of the day-to-day flying practice. Competition among pilots to be selected to take part runs high, and for a new pilot his selection carries with it his squadron commander's acceptance of him as "fully operational."

This type of exercise culminates periodically in full-scale defence exercises such as "Dagger" and "Foil." During these exercises the keenness and enthusiasm of the station rise to a remarkable pitch. For many days beforehand there is fierce rivalry between the squadrons to procure the highest possible serviceability. The pre-exercise briefing is open to the whole station, and every airman and airwoman who can be spared from work attends. The pilots' enthusiasm is natural, for there is a great sense of satisfaction in a neat, quick interception culminating in the unforgettable experience of being one of a wing of Meteors diving to engage a large formation of the silvery B29's or B50's high and stately above the cloud-tops. The men on the ground are no less eager, and highly critical crews greet aircraft returning after failing to intercept, and turn up at the briefing room to see "their kites' " ciné films. Long hours and high pressure of work serve only to raise rather than lower their keenness.

Another high-light is the squadrons' visits to the armament practice camp. At these camps a direct comparison can be made of the squadrons' results, which again heightens the competitive spirit. The flying exercises consist of air-to-ground and air-to-air firing at both drogues and gliders. The routine duties and discipline in such things as parades are easier for the visiting squadrons than on their own station, and the break is always welcomed by all ranks. The armament camps are always close to the sea, to be near their air firing ranges, and are usually remote from large towns, so that the squadron spirit thrives in off-duty periods in the friendly atmosphere of all ranks' bathing parties, inter-squadron games, and the inevitable squadron "jolly" at a not-too-nearby inn.

The summer months are the busiest for the fighter stations. Aircraft are in constant demand for demonstrations at air displays all over the country, and frequently abroad. Much practice is put into achieving the very high standard of these aerobatic displays and the crews take the greatest pride in having the aircraft on the top line. When aircraft are performing away from base the ground crews accompanying them are taken representatively from the whole station, so that personnel on the hard routine work of second-line servicing can really identify themselves with the glamour of the final display.

A succession of squadrons of the Royal Auxiliary Air Force visit the station during the months of July and August. As for many of those personnel the attachment is also their annual holiday, a characteristic of the squadrons is their abounding high spirits. So to whatever extent the auxiliaries regard their stay as a holiday, however, they obviously do not mean it to be a lazy one. They are keen to be abreast of the latest developments in tactics, administrative procedure, equipment and engineering skill—though there is no great gulf between the state of the Royal Auxiliary Air Force and the modernity of the Royal Air Force. Royal Auxiliary Air Force squadrons take part in the large-scale defence exercises, and fit perfectly into the station plan for the exercises. No undue effort is required of the station to fit them in, although, of course, everything possible is done to smooth their path.

The social aspects of these summer camps are also encouraging. Dining-in nights with a set of fresh songs brought by the auxiliaries are always a success, and the effects on young National Service airmen of coming into contact with

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men who have served in the Royal Air Force and are keen enough to devote their spare time to serving it still, can only be beneficial.

The routine of the station has been described, but what of those who man it? An attempt has been made to convey the atmosphere of a fighter station, the atmosphere of urgency and eagerness which has undoubtedly an effect on those who live with it. Enough has been written about fighter pilots to inform anyone who wishes to study the habits of that species, but the fighter airman has received rather less publicity. One brand is well understood by all: the squadron crew, who see the aircraft off, bring them in after landing, and whose responsibility it is to exercise a fatherly care on the pilots and their aircraft. True to the fighter tradition, they work in frenzied spells with periods of comparative inactivity between. Theirs is the final duty to ensure that the aircraft is airworthy. Their ears receive the pilot's praise or criticism of the aeroplane. They are the squadrons; they belong to fighting units and are proud of it.

But they constitute less than a fifth of a fighter station, and behind them labours a large and comparatively anonymous mass of mechanics, cooks, clerks, drivers, and all the trades to be found on any and every station. Of these men and women, less than half come into working contact with aircraft, and more than half are National Service entrants. Yet in the main there is to be found in them that same quality of urgency which is so typical of those more directly associated with fighter aircraft. Watch the shift workers, such as telephonists and cooks, turn out in their time off on a chilly day to see a flying display. Watch the steady stream of applicants for flights in the communications aircraft, see how they all work fifteen hours a day when a "Dagger" or a "Foil" is on. The spirit of these people is plain.

Many things have changed since the time when the Hurricanes and the Spitfires gave battle throughout all-too-long summer days. One thing that will remain as long as there are aircraft to fly is the distinctive character of those who man our fighter stations—proud inheritors of a restless tradition.

AIR DEFENCE

"Defence is not merely a matter of guns, ships and aircraft. Every man and woman in the nation has his or her share in its defence. . . . In the last war we lost all the first rounds of the contest and in fact were unpleasantly near to being knocked out. With modern developments in the technique of war we simply must realize that we cannot afford to take such chances again. . . . The most immediate and the most dangerous threat would come from the air, and the trouble is that that threat can develop a great intensity so rapidly . . . that the possibilities of a short blitzkrieg are probably more tempting to an aggressor than ever before."—Lord Tedder, speaking on "Air Defence" to the Royal Empire Society.

This warning cannot be published too often. Every citizen should know of it, believe in it and act accordingly to see that our Air Force is adequate and always in a fit state to save us from disaster.

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HOW DOES THE AIR FORCE GET ITS FUEL?

By Group Captain B. S. Cartmel, O.B.E.

INTRODUCTION

PETROLEUM, because of its physical and chemical characteristics, the complex problems of its storage and distribution, the inherent instability of certain of its products, and the vast tonnages that are required, has no counterpart in the field of modern logistics. Moreover, the conflicting needs of industry, overseas trade and civil economy generally for ever complicate the picture. Since in the past no vital air operations have been reduced in intensity by reason of a lack of supply or restrictions that could have been avoided, there is a very real and very understandable danger of complacency in those organizations which, in a major or minor capacity, are responsible for moving aircraft about the world. The subject therefore merits detailed and progressive study in order to ensure that supply will keep abreast of problems arising out of research, new types of aircraft and new conceptions of tactics and strategy. The development of gas turbine engines and guided missiles, the ever-increasing range and consequent increased consumption by jet- and reciprocating-engined aircraft, the methods, scales and potentialities of attack by possible aggressor nations, and the changing technique of mobile and amphibious operations, all present ever-changing problems of supply.

It should be stressed at this stage that the needs of naval aviation in peace and war will be met by the Royal Air Force on the common-user principle. While civil aviation is self-supporting in peace, the responsibility for supply in war has yet to be determined, but there is no reason to believe that it will differ from the organization that existed, for instance, during the Berlin air-lift operation when supplies were provided under normal R.A.F. arrangements.

THE PATTERN OF THE OIL INDUSTRY

The fact that oil is a liquid determines the methods used at each stage of the operations of the industry from prospecting for crude to the distribution of its many products. The geographical location of known underground oil resources divides the countries of the world into two main classes: those producing oil surplus to their own needs and those whose requirements need to be wholly met, or supplemented, by imports. This fact has led to the great growth of the international trade in petroleum which now exceeds, in value and volume, that of any other commodity. The oil industry embraces four main groups of activities, each of which can itself be classified as a major industry. These are:

(*a*) Prospecting and production.
(*b*) Refining and manufacture (including research on the chemistry of petroleum and on the application of petroleum products).
(*c*) Transportation by tanker, pipe-line, rail and road.
(*d*) Distribution.

All the above operations are carried out under widely varying conditions and many of them by the use of plant and equipment peculiar to the industry. Let us first consider the oil industry of the U.S.A., where, of a total world oil produc-

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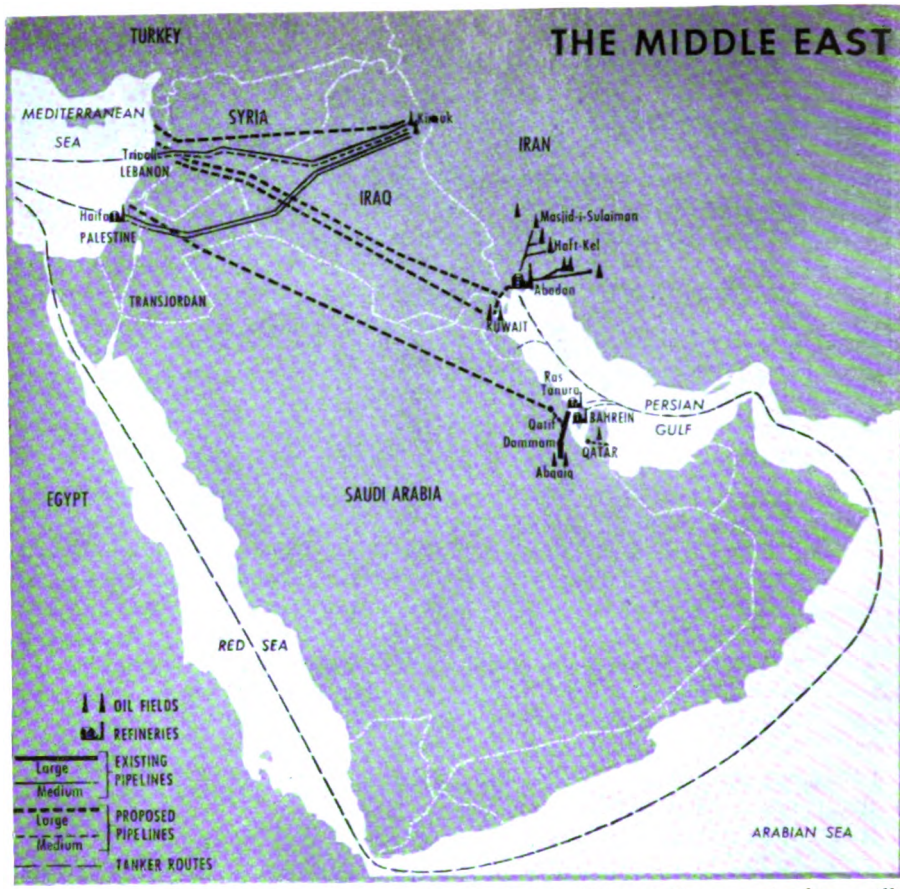

The map indicates how, in moving Persian Gulf oil to Western Europe, pipe-lines will effect an important saving in mileage, and hence in costs, over the all-sea route now in use

[*Photos:* ***Shell Photo Unit, London***

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tion of about 427 million tons, the U.S.A. produces and consumes about two-thirds and also exports and imports considerable quantities. Oil production in the rest of the world is about half that of the U.S.A. and comes from a score of countries, among which Venezuela and Iran are the leading exporters. In 1947 these two countries provided about two-thirds of the oil which enters international trade. The figures given below outline the vast increase in world production between 1938 and 1947:

	Thousand Metric Tons			
	1947	%	1938	%
U.S.A.	265,800	62.3	170,700	60.9
Western Hemisphere (excluding U.S.A.)	84,200	19.7	45,100	16.1
Near and Middle East	41,800	9.8	16,100	5.7
Far East	3,500	0.8	10,200	3.6
U.S.S.R.	25,000	5.9	30,100	10.7
Europe	6,500	1.5	8,300	3.0
World Total	426,800	100.0	280,500	100.0

TRANSPORT AND DISTRIBUTION

Crude oil starts its above-ground life in a small storage tank on the producing field whence, after treatment for the separation of water, it is pumped through the collecting line system into one of the steel storage tanks in the field tank farm. This tank farm may be situated on the coast if the field is not far distant, or far inland as is more usual. In the former case the crude oil is transported to the refinery by tank steamer; in the latter case by pipe-line.

Trunk Pipe-lines

The possibilities of trunk pipe-lines have long been realized. One of the earliest was that constructed in 1897 between Baku and Batum on the Black Sea for the bulk transportation of kerosene. Another well-known set of lines is that between the refinery centre in Rumania (Ploesti) and the shipping port of Constanza on the Black Sea. Many thousands of such lines have been laid, particularly in the United States, for the transport of crude oil from the oilfield to the refineries, often at great distances. One such line, 1,400 miles long, carries crude oil from Texas to the refinery at Wood River, Illinois. During the last war a great number of such lines were laid, some to release tankers which were in desperately short supply, and others for strategic reasons, and to relieve the load on the overburdened railways. Such a system for the transport of oil to the principal centres of consumption was laid down in the United Kingdom and much of it exists today. It consisted of eight-inch and ten-inch pipe-lines and enabled tankers to discharge on the West Coast and thus avoid the hazardous journey through the English Channel or round the north of Scotland.

The aviation gasoline circuit had spurs to the principal bomber airfields where the offtake was the heaviest, so the supply was virtually "on tap." This undoubtedly contributed largely to the sustained bomber offensive, particularly during the latter part of the war. For Operation "Overlord" branches were extended to points on the South Coast of England to feed the "Pluto" (pipe-lines under the ocean) system of cross-Channel lines to support the Allied ground and air forces in the invasion of Europe. Pipe-lines were used extensively in the Mediterranean in 1943-44 in the Tunisian campaign, in Italy, and ultimately in Operation "Anvil," the Allied invasion of Southern France. In spite of the increase in pipe-lines for the transport of P.O.L. during the last war, it is necessary to sound a note of warning lest too much emphasis be given to this method of distribution. Not that "pipe-line consciousness" should be discouraged, but it

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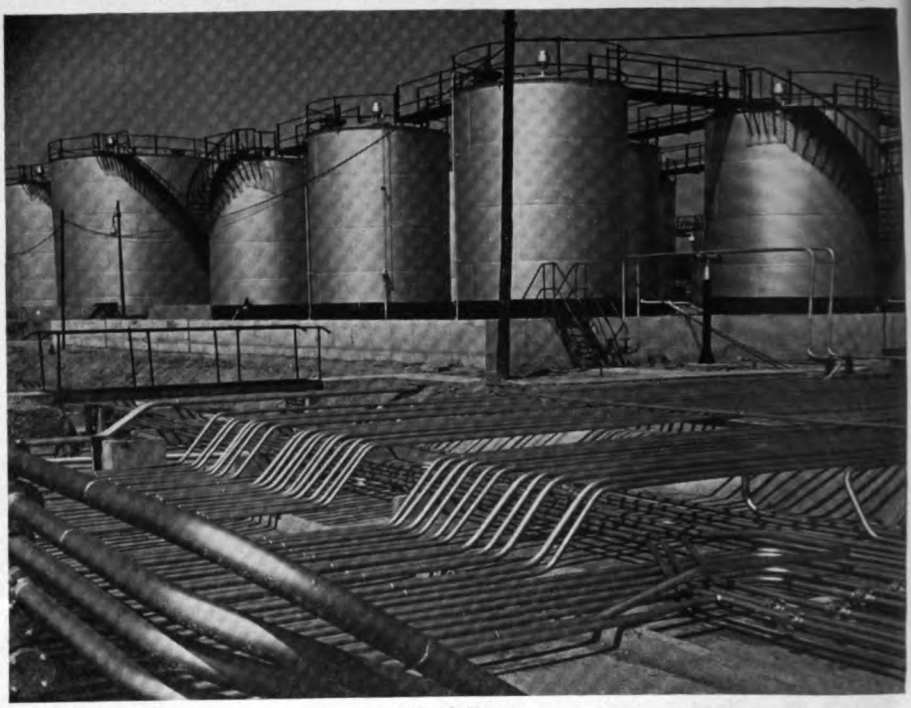
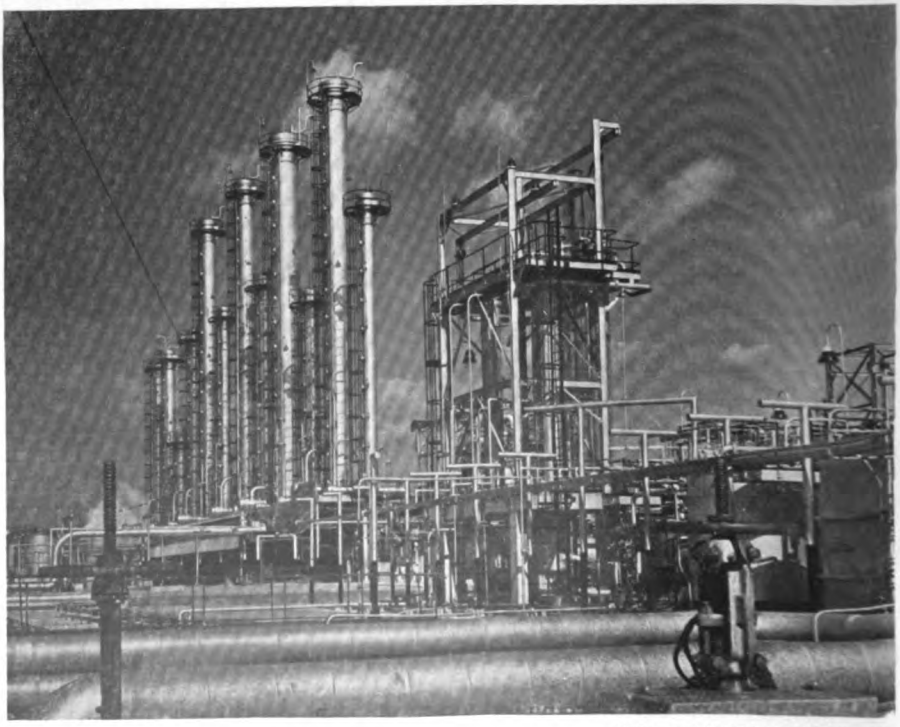


A Tank Farm



[Photos: Shell Photo Unit, London

A Distillation Unit

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should be realized that the cost of such projects is necessarily considerable; they can only be justified financially if throughput is sufficient to keep the line fully employed pumping twenty-four hours a day; large reserves would be immobilized in the pipe itself in the event of a breakdown of the pumping system; and distribution by pipe-line is not so flexible as other methods, such as rail, road, coastal tanker, etc., and is therefore limited to deliveries to large centres of consumption, the route if and when possible being arranged to pass through minor centres where immediate offtake points can be provided. These would be airfields, M.T. and A.F.V. staging and concentration areas, and so on.

Sea Transport

The first cargo of petroleum to be transported across the Atlantic was carried in wooden barrels stowed in the single hold of a brig in the year 1861. This method was employed for some years and the price of petroleum to the consumer in the United Kingdom included the cost of filling and emptying the barrels, returning the empties, and loss of freight due to the circular shape of the barrels requiring large space in proportion to the amount of oil carried. The first attempt to reduce the price of petroleum sold in the United Kingdom took the form of fitting iron tanks of large capacity into the cargo holds, and subsequently the wooden hulls were lined with felt on cement. In this way the idea of transporting oil in bulk progressed and was the forerunner of our modern tanker fleets.

Average ocean-going tankers today are about 12,000 tons dead weight (i.e., the amount of oil carried) and have a speed of about 12 knots. During the war, however, large tankers were built of 16,000 tons and upwards with speeds of $14\frac{1}{2}$ to $17\frac{1}{2}$ knots. The well-known American "T-2's" were among the latter class. Tankers of 35,000 tons dead weight have been under construction recently in the United States, but because of their deep draught the number of ports which they will be able to enter when fully loaded will no doubt be limited.

Normally, tankers load or discharge a full cargo and discharge or take on ballast in forty-eight hours. In normal times tankers spend about 320 days at sea every year, which is about 50 per cent. more actual steaming time than dry cargo ships. Coaster tankers varying from 100 to about 3,000 tons in capacity are used for supplying ports which are inaccessible to larger vessels. They were extensively used in the North African campaign in 1942-43 for transporting fuel from the Delta to Tobruk, Benghazi, Tripoli and other places, and from Algiers to Bone, and later Bizerta and Tunis. In the early critical stages of the Berlin air-lift coasters normally used for the distribution of fuel around the British Isles were diverted hurriedly to supply and build up stocks of 100/130 grade gasoline in the storage depots in Hamburg to meet the ever-increasing consumption until such time as normal bulk supplies could be assured either from the United Kingdom or direct from refineries overseas. More than four months elapsed before the supply and availability of aviation fuel in Germany ceased to be a cause for anxiety, yet the magnificent air effort continued without interruption. Prior to this operation the consumption of 100/130 grade fuel in B.A.F.O. was only about 1,000 tons per month; at the peak period of the air-lift fuel was being consumed at a rate exceeding 14,000 tons per month. The immensity of the P.O.L. logistic problem, coming as it did with no warning, can therefore be appreciated and merits reflection and study when similar operations or training exercises overseas are being considered in the future. On this occasion the supply organization had only to contend with one combat grade, namely, 100/130 gasoline. Had other grades, such as 115/145 and turbine fuel, been required in large quantities in addition, the logistical implications might have been insuperable.

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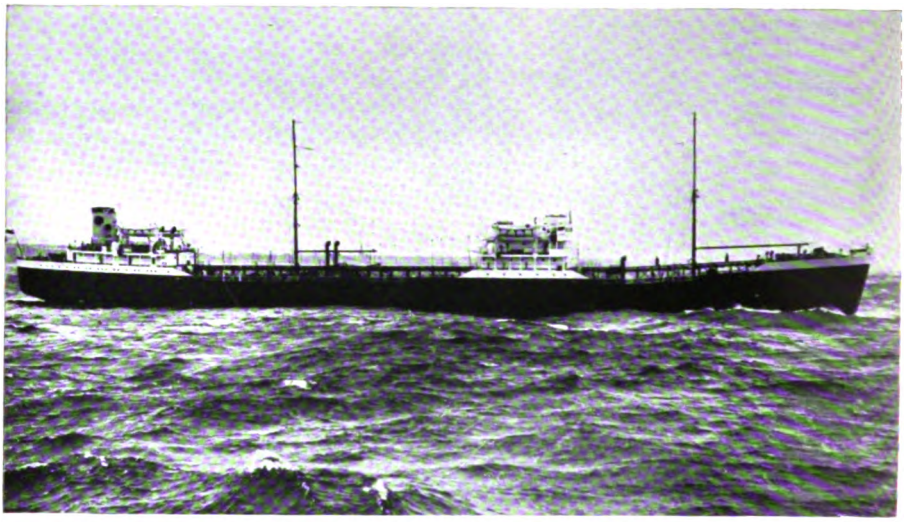

Ocean Tanker, 12,290 tons

Photos: Shell Photo Unit, London

Road and Rail Distribution in Operation "Plainfare"

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Installations

"Tank farms" are a large collection of tanks used to store vast quantities of crude oil, perhaps from several fields and grouped at a convenient spot adjacent to the terminal of a large trunk pipe-line or a refinery.

"Major" and "minor" installations and depots are terms applied to a collection of tanks, with the associated plant, pumping equipment and so on for dealing with the storage and distribution of petroleum products. In the United Kingdom the Air Ministry owns a large number of aviation fuel reserve depots (A.F.R.Ds.) and aviation fuel distribution depots (A.F.D.Ds.) from which fuel can be distributed by pipe-line, rail and road to airfields. The maximum capacity of the former type depot is 145,000 tons; the latter 44,000 tons; some of the storage is above ground, some is underground or semi-underground. A.F.R.Ds. are equipped with T.E.L. blending equipment.

Distribution from Installations or Depots

Road, rail and inland water transport are all regularly employed, and in extreme cases even air transport is utilized, e.g., during the Berlin air-lift. Rail cars in the United Kingdom vary from ten to twenty tons' capacity, but may be as much as thirty to fifty tons in other countries.

Delivery by road is generally assuming greater importance, and with improved design of vehicles, better roads and the possibility of transporting larger loads the feeding of small depots and even airfields in this way direct from main installations is often more economical and practicable than rail transport. Modern type vehicles used in this connection are normally of 2,000 gallons' capacity.

Isolated airfields overseas, such as Masireh in Saudi Arabia, landing grounds in the Sudan, and so on, are supplied with packed fuel, i.e., in barrels or drums, because of the non-existence of conventional means of storage and transportation. At Masireh, which is perhaps the most isolated Royal Air Force station in the Middle East, barrels are rolled through the surf between the ships and shore by native labour.

FUTURE PROBLEMS

Among the subjects requiring resolution at Cabinet level are the expansion of sterling oil resources; the stockpiling of reserves required for consumption in war; plans for the expansion of tanker fleets in emergency; the provision of tankage at home and overseas for the storage of national petroleum reserves; the allocation of steel for pipe-lines, storage tanks, barrels and drums; and where disruption in supply is likely owing to air attack or sabotage, plans for the development of alternative anchorages and ports and methods of tanker discharge, terminal storages and inland distribution facilities.

Problems in which the Royal Air Force has a direct responsibility include the following:

(*a*) The standardization of aviation gasolines, turbine fuels, engine lubricants, hydraulic and de-icing fluids and other petroleum products with the air forces of the United States, the Dominions and the Western Union Powers, including naval aviation throughout.

(*b*) The provision of tankage at home and overseas to hold the reserves of aviation fuels required for war.

(*c*) The development of airfield tankage and methods of aircraft refuelling to ensure a speeding up of this important operation and the quick turn-

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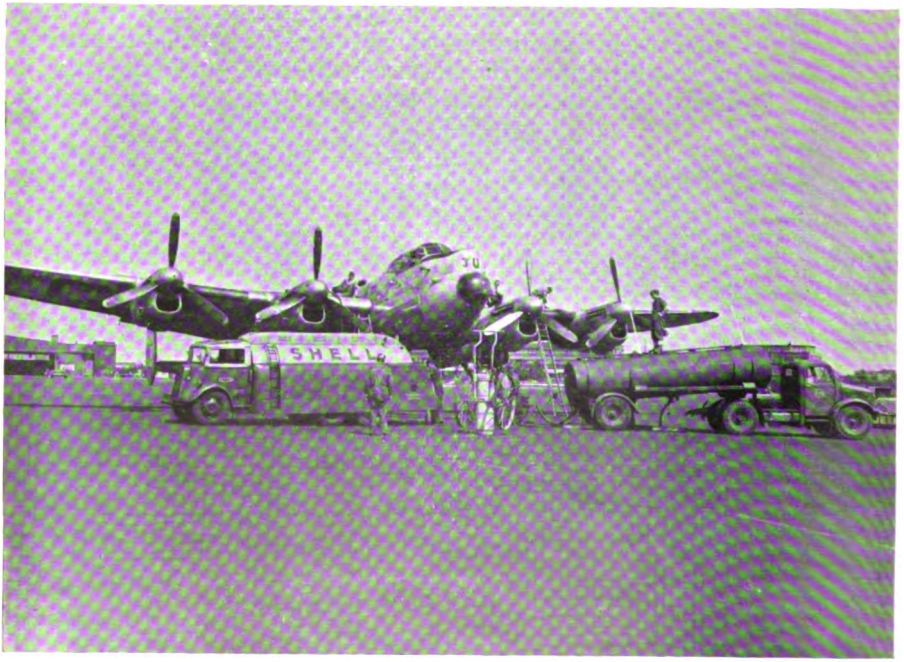
Primitive methods of handling in East Africa



[Photos: Shell Photo Unit, London

Modern method of refuelling aircraft, 1950

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round of aircraft, particularly under dispersed conditions. This problem has assumed greater proportions today owing to the introduction of the gas turbine engine and the importance of avoiding the contamination of high-grade gasoline with kerosene or other fuel required for jets.

(*d*) Improving the technique for the supply of aviation fuel in amphibious operations and to tactical air forces in conditions similar to those under which the campaigns in the Western Desert and Normandy respectively were fought in the last war.

For reasons of security it is not possible to do more than record that the above problems are adequately appreciated by those directly responsible and action is well advanced to find satisfactory solutions to them all. Although the Petroleum Board was disbanded in July, 1948, there is every reason to believe that if war threatened again it would be reconstituted immediately and could be expected to achieve the magnificent results it did in the Second World War. But to enable this to happen without confusion and without adverse effect upon the operational effort of the R.A.F., particularly in the early and vital stage of a war, it is essential that in peace all those directly concerned with supply, provision, storage and distribution of aviation fuels must constantly appreciate the ever-changing problem which is concomitant with the re-equipment of squadrons; the replacement of the reciprocating engine by the gas turbine; the ever-increasing range and fuel consumption of new types of aircraft; the cold-weather conditions under which aircraft will have to operate in a future war either at height or in Arctic theatres; and the introduction and development of guided missiles, rockets and similar weapons and the fuels likely to be required for their propulsion and the lubrication of vital working parts.

CONCLUSION

In spite of past lessons when, for example, three million gallons of fuel (10,000 tons), or a complete tanker cargo, were consumed by Bomber Command in a single big operation, sometimes twice in twenty-four hours at the peak period of the air war; when for the North African invasion in November, 1942, Operation "Torch," over 60 per cent. of the total tonnage required was for petroleum; when an average of 15,000 bulk trains from 250 to 400 tons each in capacity were loaded annually in the United Kingdom during the war to assist in reducing the turn-round time of tankers in the congested West Coast ports and to ensure greater flexibility in overland distribution; when, in 1944, four and a half million tons of petroleum products moved through the United Kingdom pipe-line system; and, most fresh of all in one's memory, when the R.A.F. (including civil aircraft) consumed 140,000 tons of 100/130 grade gasoline during the Berlin air-lift, it is still evident that, like so many other supplies that "come up with the rations," petroleum is taken very much for granted. Perhaps this can be regarded as a compliment to those responsible for its procurement and supply in the past, but it is on the future that attention and thought must be focused, for if one considers the changing conditions mentioned above it is obvious that the disaster of another war will cause even greater logistical problems than occurred last time. If the Royal Air Force, in conjunction with its allied air forces, is to be able to operate on a world-wide basis in any future emergency or war, possibly without prior warning or preparation as was the case when the blockade of Berlin was imposed, its immediate and most vital item of supply, petroleum, must always be available in sufficient quantity where and when required. There is little doubt that this ideal can be achieved as it has always been in the past, provided that the subject is given the constant attention it demands.

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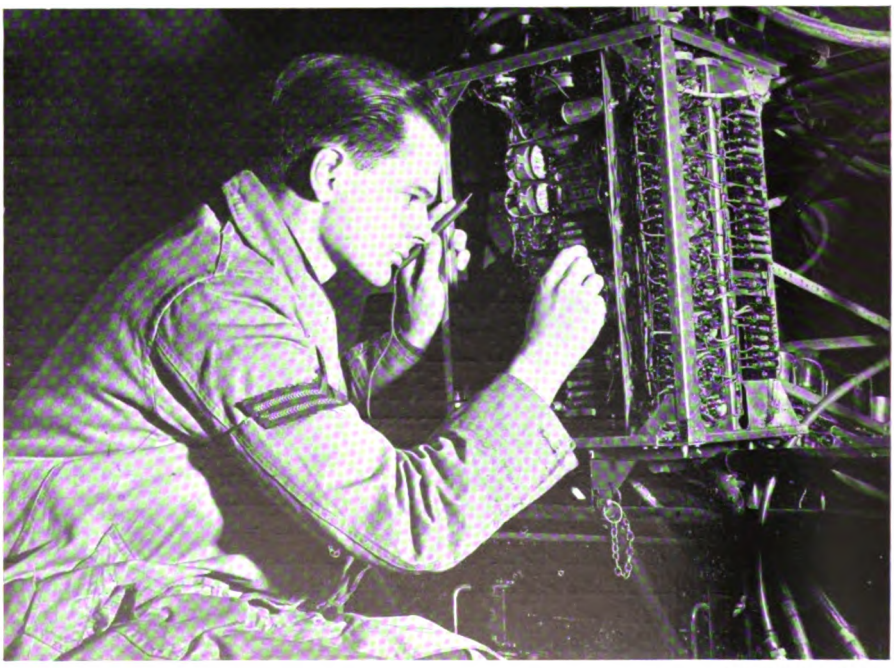
A Mobile R/T Receiving Cabin



[*Air Ministry Photos*

Corporal A. J. Selwood, radar fitter, repairing ground equipment

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THE WORK OF SIGNALS IN THE ROYAL AIR FORCE

By Group Captain M. K. D. Porter, C.B.E.

THE over-all efficiency of the Royal Air Force depends upon all branches and sections working together as a team, and we should all be more efficient if we had a good general knowledge of everyone else's job. The purpose of this article, therefore, is to describe in general terms the work of the Signals in the Royal Air Force for the benefit of those who may not have had the time or opportunity to learn much about it.

Broadly, the responsibilities of the Signals Branch are the provision of communications, radar in its many forms, radio aids to flying, and the associated services such as radio counter-measures and codes and ciphers.

POINT-TO-POINT COMMUNICATION

The most important and the biggest of the Signals tasks is the provision of the wireless and land-line communications which link the Air Ministry, headquarters and units together. Speech, teleprinter and Morse facilities can be provided by means of either wireless or land lines. However, whenever circumstances permit, land-line communications are used, because they offer greater security, wireless being kept as a standby for use when landlines are interrupted by bombing or other causes. There are, however, many occasions when it is impossible or uneconomical to use land lines, particularly overseas, and as a result wireless communications are very widely used.

The fact that the G.P.O. at home and the Army overseas provide land lines and land-line equipment for the R.A.F. does not absolve signals officers from all responsibility in the matter; their job is to decide upon the number and type of land lines needed to meet R.A.F. requirements, to state any special routeing of land lines that may be necessary, to decide how each line should be terminated (e.g., on an exchange, keyboard or teleprinter), to provide and train teleprinter and telephone-exchange operators, and to detail the methods of handling and routeing traffic so as to obtain the most efficient use from the communications. To do these jobs they must have a very good working knowledge of land-line engineering and must work closely with the G.P.O. and the Army so that together they may calculate how best the requirements may be met from the available resources.

It will be appreciated that the task of providing each commander with the communications necessary to enable him to administer and operate his forces and of providing everyone with the communications necessary to enable them to pass messages to any unit or formation in the R.A.F. or, for that matter, in the Army and Navy, is a complicated one because of the variety of forms of communication that it is necessary to employ and because great ingenuity is necessary if all the many requirements are to be met from the strictly limited man-power and equipment resources.

AIRCRAFT COMMUNICATIONS

The Signals Branch has to provide facilities for intercommunication between ground stations and aircraft, aircraft to aircraft in formation, and between

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members of the crew of an individual aircraft. Communication is necessarily by means of wireless and may be speech (R/T) or Morse (W/T), or both; R/T is operated by the pilot and W/T by an operator carried as a member of the crew. The range of R/T is limited by the power, and therefore by the size of the transmitter which can be accommodated in the aircraft, whereas, with properly chosen frequencies, the range of W/T communications is sufficient for all practical purposes. R/T is, consequently, used by itself only in single-seater aircraft and in multi-seater aircraft which are required to operate only within R/T range of their base, all other aircraft being equipped with both R/T for short-range and W/T for long-range communication.

The most difficult part of the signals officer's job in providing communications with aircraft is to acquire a sufficiently detailed knowledge of operations to be able to provide ground stations in the right places and to be able to organize the use of the limited available wireless frequencies to enable instructions to be passed to aircraft in the air, instructions to be passed by formation leaders to the pilots in their formation, pilots to request assistance and landing instructions, and aircraft reinforcements to be sent to the assistance of other units, all without interference between the various channels of communication. Of the two types of communication, W/T is the easier to organize because the operator in the aircraft can tune his set to any one of a large number of frequencies at will, whereas R/T sets have to be pre-tuned on the ground and give the pilot only a very limited number of frequencies on which he can communicate; the signals officer organizing R/T communications, therefore, has to solve the problem of providing all the necessary facilities, required by each pilot, over a very small number of channels of communication. Needless to say, considerable effort has been devoted to developing R/T sets which will allow the pilots a much greater selection of frequencies and so give them more facilities besides easing the signal officer's problem.

CONTROL AND REPORTING SYSTEMS

The success of defensive fighter operations is dependent upon a knowledge of the movements of enemy aircraft and the ability to direct the fighters into a position from which the pilots will be able to attack them. These two requirements are met by control and reporting systems consisting of radar stations at which movements of both enemy and defensive fighter aircraft can be plotted and from which the fighters can be given directions as to course to steer and height to fly to make contact with the enemy, and observers at various centres to plot the approach and movements of enemy aircraft by visual observation. These radar stations and observer centres are connected together and to group and command operations rooms so that the operations can be co-ordinated, an appropriate sized force sent to intercept each raid and all components of the fighter organization warned of the approach of enemy aircraft.

Radar has an optical range and does not see round corners; the earth being a sphere, the range at which an aircraft can be detected by radar, therefore, is limited and is directly proportional to the height at which it is flying. In addition, the performance of any radar equipment depends upon the physical characteristics of the site and no one piece of equipment provides fully efficient cover at all heights. Thus, to provide efficient radar cover over an area a signals officer has to calculate the number of stations required and the types of equipment to be installed at each station, besides choosing the site of each station with great care. Once the stations have been set up their use is a matter for the operations staff, but because there is a very close relationship between operational use and

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technical performance of the equipment, signals officers have to work closely with the operations staffs.

Finally, the signals officer has to set up all the necessary point-to-point communications between operations rooms, radar stations and airfields and the necessary aircraft communications. It is worth noting that radar stations require far more communications than would appear at first sight to be necessary; they have limited range and themselves require communications to obtain warning of the approach of enemy aircraft through areas covered by adjacent stations, communications to call for the aircraft which they are to control, communications to direct aircraft under their control and communications for their day-to-day administrative needs.

RADIO MEANS OF TARGET LOCATION

The necessity for accurately locating targets whether on the ground or in the air is obvious. The visual method of doing so is limited by the standard of eyesight of the observer, and the visibility conditions; to improve on this method many radar aids have been developed, aids such as H2S to enable bombers to locate their targets and if necessary to bomb blind, A.I. to enable night fighters to close with enemy night bombers, A.S.V. to enable coastal aircraft to locate surface craft and submarines, and so on. These aids may be divided into three classes: those depending solely on airborne equipment, those depending on ground equipment and complementary airborne equipment, and those depending on ground equipment with communications to the aircraft. Of the three classes those depending solely on airborne equipment require the least number of men to operate them: they do not require an elaborate ground organization, they can be used by any number of aircraft operating at one time, and they can be used wherever the aircraft. The aids dependent upon ground stations can be used only within the range of these stations; the number of aircraft which can use each aid at one time is often limited, and the ground stations themselves usually require very careful siting and a fairly elaborate system of communications. However, the degree of accuracy which can be obtained with each type of aid is different and the signals officer advises the operations staff which of them is the most suitable for each of the tasks the force may be required to undertake. Once the aid or aids have been chosen it is then his job to obtain, install and service the airborne equipment and, if necessary, to arrange for the use of existing ground stations or for the setting up of new ones. The setting up and servicing of ground stations is usually undertaken by a central authority to economize in the very skilled personnel required for these tasks.

RADIO AIDS TO NAVIGATION AND LANDING OF AIRCRAFT

At the start of the last war radio aids to navigation and landing consisted of direction-finding stations which could home or fix aircraft, W/T beacons which enable aircraft to home on to or to obtain bearings from them, and the standard beam approach landing aid. All three aids were successfully used during the war, but the development of radar enabled many more facilities to be provided. By means of Gee any number of aircraft within medium range of the necessary ground stations could fix themselves with accuracy; airborne radar equipment operating with appropriate radar beacons on the ground, provided navigators with fixing and homing facilities, and radar systems of beam approach were evolved for assisting pilots to land in conditions of poor visibility In fact, by the end of the war we were troubled by having too many radar navigation aids, many providing much the same service but none capable of providing a universal

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service over any one field. This was necessary in war, but now the aim is to standardize the fewest number of aids to meet all the requirements.

It would be impossible to provide a universal service if each command had its own private radio navigational aid ground stations and they are therefore installed for common use by pilots of all aircraft fitted with the appropriate equipment. However, many of the ground stations must, for geographical and administrative reasons, be placed under commands and the signals officers concerned are responsible for their efficiency not only to their commander but also to the Director-General of Signals, who is the central authority responsible for the technical efficiency of the whole service.

Once more the signals officer must have a good knowledge of the operation of aircraft besides a good technical knowledge of the equipment, in order that he may give sound advice to the air staff and so that he may understand the importance of the navigational aids to the pilot.

SIGNALS SECURITY

It is assumed that an enemy will try to obtain intelligence by intercepting our signals traffic and it is one of the jobs of signals to keep a watch on it to ensure that no important leakages occur. This is known as signals security and it is one of the tasks of all signals officers.

The maintenance of signals security is a constant battle between security and the speedy transmission of messages, and consideration has to be given all the time to the question: Which is the greater ultimate value to operations, speed or security? The signals officer, therefore, has to assess the degree of security of each communication link in order to decide whether messages passed over them should or should not be ciphered, and has to advise operations staff how to avoid disclosing valuable information to the enemy when passing plain-language messages to aircraft.

CODES AND CIPHERS

For security reasons, many messages must be coded or ciphered before transmission and the organization for doing this is a signals responsibility. The operations of ciphering and deciphering are links in the passage of a message between two points and they increase the total time to send a message from one place to another. The work is exacting and the personnel, often W.R.A.F., who do it have to be extremely conscientious and accurate in order to avoid errors and so ensure that unnecessary delays caused by checking and repeating messages are reduced to a minimum.

RADIO DECEPTION AND COUNTER-MEASURES

The knowledge that the enemy will be trying to intercept our signals with the object of gaining information and using radar stations to plot the movements of our aircraft offers tremendous scope for deception and a good method of achieving surprise in war. For example, false information can be transmitted, dummy wireless transmissions can be made to conceal movements of headquarters and units, and small numbers of aircraft can be made to appear as large formations to enemy radar stations.

Coupled with radio deception measures are radio counter-measures, which are the means of interfering with the enemy's radio to prevent him from using it effectively. In the last war a large organization was built up to interfere with the German radar stations and the control communications of their night fighters

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[Air Ministry Photo

Radar operators come up for fresh air and sunshine during a break in training. (Left) *A.C.W. Lesley Zeigler, of Ringwood, and Corporal Pamela Keenan, orthoptist of the Royal Victoria and West Hants Hospital*

and so enable our bombers to reach their targets and to return safely to their bases. Jamming equipment was carried in special aircraft which accompanied the bomber force, and ground jamming stations were operated both in the United Kingdom and, later, on the Continent. Success was achieved and from experience gained it may be presumed that, in any future war, radio countermeasures will be used: if this is so, the battle will be a continuous one between newly designed equipment and radio countermeasures, with signals officers endeavouring to design their local signals organization so that operations and administration can continue effectively despite jamming.

RADIO ENGINEERING

The last, but by no means the least, of signals responsibilities is the installation, servicing, repair and modification of signals equipment. This task is complicated by the variety of equipment in use and by the fact that a great deal of the ground equipment is located in penny packets in signals stations situated away from R.A.F. stations. In addition, much of the equipment is required to operate continuously for long periods.

The installation, repair and modification of large ground radar and wireless stations requires the services of highly specialized personnel and elaborately equipped workshops. It would be uneconomical to provide them in every command, so all such work is undertaken by a special signals group at home, whilst overseas the work is centralized at base signals and radar units or at suitable maintenance units. All other equipment is serviced by the signals section of the unit concerned.

No. 90 GROUP

No. 90 Group is a signals group operationally controlled by the Director-General of Signals at the Air Ministry. Its job is to do major installation and servicing of ground signals equipment and to be responsible for such signals services as cannot be allocated to any individual command. For example, No. 90 Group is responsible for the organization of, and the operating procedures for, the non-operational telephone and teleprinter communications at home, for operating the United Kingdom terminals of the wireless links with overseas commands, for the operation and administration of radar stations used solely for reporting, and for the operation and administration of Gee stations and radar ground stations providing blind-bombing aids. No. 90 Group is responsible, among other things, for installing all permanent signals equipment at home and

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such of the equipment overseas as cannot be done by local signals sections, the calibration of radar stations and radio navigational aid stations, the servicing of all home radar stations, and the fitting of major modifications to ground signals equipment.

To do this work No. 90 Group has a number of formations called areas which are responsible for the No. 90 Group signals stations for any necessary installation, servicing and modification of signals equipment in their areas. No. 90 Group also has facilities for undertaking major workshops tasks and controls the Central Signals Establishment, whose job it is, among other things, to keep alive the technique of radio counter-measures and deception and to provide skilled personnel and aircraft to calibrate radio navigation aid and radar stations.

CONCLUSION

In an article of this length it is impossible to do more than skim lightly over the subject of signals and there are necessarily many omissions of detail. Sufficient has been written, however, to show that the work of everyone in the Royal Air Force is closely connected with at least one of the many tasks of signals. It is hoped, therefore, that this article will encourage the Service reader to seek further information about those aspects of signals work which particularly interest him and, more important, that it may stimulate other writers to describe the work of their sections.

Are you joining in the thanks to our friends in the Commonwealth and U.S.A.?

OUR friends "Over There" have already sent us £80,000,000 worth of food gifts since 1940.

We can thank them for this overwhelming generosity by supporting the Lord Mayor of London's National Thanksgiving Fund. The proceeds are to be used chiefly to develop a centre in London which will provide students from the Commonwealth and U.S.A. who come over here to enlarge their experience with suitable accommodation at a price they can afford.

Anything we can do to make their stay enjoyable and profitable is a most worth-while venture.

Any bank or post office will accept donations, or they can be sent direct to

THE LORD MAYOR OF LONDON,
THE MANSION HOUSE,
LONDON, E.C.4.

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RESETTLEMENT ADVICE

By Flight Lieutenant G. E. Lanning

I: REGULARS

WHAT to do when they retire to civilian life is the bogy which haunts the minds of most Regulars. It is not an easy problem to solve. Most of the Regulars due for discharge hold positions of responsibility, they receive a respectable wage and they are getting on in years. When they re-enter "Civvy Street" they find that they have to be content with a lot less in the way of responsibility and remuneration and that they are in fierce competition for jobs with men much younger than themselves. Many people will not enter the Regular Service for this very reason: they are frightened of being left high and dry at the time when they should be making a success of life and consequently recruiting suffers. The problem of the resettlement of Regulars is one of which the Service authorities are well aware and they have advocated continually the extension of preferential treatment for ex-Service men in every form of Government employ, including the nationalized industries.

From numerous statements which have appeared in the Press it would appear that the Government agrees with the Service authorities on this question and many schemes are already in hand for the resettlement of Regulars. Many of the Government services have reserved vacancies for ex-Service men for many years now. Notifications of such schemes appear frequently in A.M.Os. and the *Services Resettlement Bulletin*: the Civil Service holds special examinations for ex-Regulars, the B.B.C. offers 50 per cent. of its unskilled jobs to ex-Service men, the Police and Post Office welcome them, and in the Yeomen of the Guard they have a monopoly. Now the Government is starting short courses in order to assist ex-Regulars to obtain posts. The first of these is the "Schemes of Business Training," the preamble to which reads: "His Majesty's Government have accepted the principle that men and women who undertake a period of Regular service in H.M. Forces should not thereby be deprived of an opportunity of entering industry and commerce at a level appropriate to their age, experience and ability when they leave the Forces. Arrangements are, therefore, being made to set up short courses of training with a view to assisting them to obtain posts in business." The response to this scheme has been surprisingly disappointing and any airman who is interested should immediately read A.M.O. A220/49, which summarizes the conditions of the scheme.

A further Government scheme which all Regular airmen should study before leaving the Service is the "Government Vocational Training Scheme." This scheme was not started for Regulars but "to assist the permanent resettlement of men and women whose training or occupation was interrupted by war service." Many present-day Regulars will, therefore, be eligible. Trades in which training is available vary from time to time and periodically a "List of Occupations" concerned with the scheme is sent from the Ministry of Labour to the Services.

The Service authorities themselves try to help their ex-Regulars, but their schemes must of necessity be small compared with those of the Ministry of Labour. The R.A.F. has a special department at Air Ministry (P5) known as "The Resettlement and Rehabilitation Department," to which ex-Regulars may apply for help. Personnel are interviewed and sent to any suitable available

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vacancy. If there is no suitable vacancy available the Department makes tentative inquiries of its contacts in the industrial and commercial world. Finding jobs is not the official task of the Department, but many ex-Regulars are placed in positions by the endeavours of its members.

The various ex-Service men's institutions all help with the securing of employment for their members, but the most successful of these is the National Association for Employment of Regular Sailors, Soldiers and Airmen—commissioned officers are not eligible for membership of the Association. No man should be allowed to leave the Service without having the good work of this Association brought to his notice. Every station is issued with its annual report and every officer and man should read it carefully. Let it suffice here to quote the main functions of the Association:

"To discover in each man his existing and potential employment value in civil life by close and careful inquiry into his character, past experience, both in and out of the Service, hobbies and family surroundings.

"To inspire employers with a true appreciation of the value of these men.

"To provide much-needed guidance to men ignorant of the commercial and industrial world regarding the best chance of earning a living, particularly long-service men who, by virtue of their service, often abroad, have lost personal contacts and to help them to solve the often difficult problems created by domestic responsibilities and restricted choice of residence."

Worthy aims indeed! And aims which are fulfilled: in 1948 62,202 ex-Service men were found jobs by the Association, and this number represents over 80 per cent. of the year's registrations.

The Government, the Services and the various welfare organizations are all trying to help the ex-Regular to find a job. What of the ex-Regular himself? Ultimately the choice lies with him and it is up to him to seek employment, not to expect it to be found for him. And he must be sure to start looking for it long before he is due for his discharge. Station education officers have to interview every Regular airman on their stations at least eighteen months before he leaves the Service. Then is the time for the airman to start aiming at his civilian goal.

The first thing to be decided, when there is a choice in the matter, is whether or not to re-engage. So often an airman decides to take his "ticket" because he is temporarily unhappy on a particular station, without thinking of the consequences. He is probably a skilled tradesman, earning enough to keep himself happy, well on the way up the promotion ladder and he knows the life that the Service offers; but suddenly he decides to forfeit years of training for a new way of living about which he knows little. Civilian life is not all beer and skittles. "There is still an impression amongst men that high wages can be had for the asking regardless of lack of qualifications on the part of the individual." (1948 Report of Regular Forces Employment Association.) This impression is wrong, but this article is not aimed to induce Regulars to remain in the Service but to advise them on the best procedure when they have decided to leave.

Firstly, then, they should visit the station education officer eighteen months before their time is completed. There are two reasons for doing this: to see what help the education officer can give in preparation for a chosen job; and to seek advice on choosing a job. If a man has no clues on what he wants to do—and many have not—there is little else the education officer can do but send him to his group headquarters for a psychometric test, by means of which it is hoped to discover the most suitable *kind* of work a man should do. Having done this, the potential releasee has at least a year to study for any examinations which may be necessary, to secure and complete the appropriate application forms, look for a

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house and, if he is a tradesman, seek recognition by the appropriate trade union. All of which takes a good deal of time, so that eighteen months is not too soon to start preparations.

If the airman has discovered only the *kind* of job he needs and not any particular one, then he must spend the last year of his Service life searching for work. He must read A.M.Os. and the *Services Resettlement Bulletin* carefully; he should seek advice on Government schemes and read all the resettlement pamphlets displayed in the unit information room; and, finally, he should register with the National Association for Employment of Regular Sailors, Soldiers and Airmen.

Without doubt it is a more difficult task for the Regular serving airman to resettle in civilian life than it is, say, for the young National Service man, but, provided that he decides soon enough exactly what he wants to do and works towards that goal, seeking advice wherever practicable, both from Service and civilian sources, then he should have no fear of securing a good, steady job. Many people will be willing to help him in his quest, but he is best able to help himself.

II: NATIONAL SERVICE MEN

National Service men are easier to resettle than Regulars. They are younger, probably more adaptable and in the majority of cases they are returning to their former employment. Moreover, the Ministry of Labour and National Service, whose task it is to resettle these young people, has published a number of informative pamphlets advising them on post-Service careers. All National Service men should read these pamphlets carefully during their Service careers to see which ones apply to them and contact their station release and resettlement officers for more detailed information.

For those who intend to return to their previous employment there are two pamphlets, R.E.L.1 and R.E.L.2, which are summarized here. By the Reinstatement in Civil Employment Act of 1944, modified by the National Service Act of 1947, employers are obliged to take into their employment former employees who have undertaken a period of whole-time service in His Majesty's Forces, subject to the condition that reinstatement is "reasonable and practicable." The "former employer" is the one who last employed the applicant within the period of four weeks immediately preceding the beginning of his whole-time service, so that if the applicant was unemployed during those four weeks he has no reinstatement rights. If the employment has changed ownership the new employer is regarded as the "former employer." The term "reasonable and practicable" is important: it is not defined in the Act. It is obvious, however, that a man, before enlistment, might have been doing the job of another man already undertaking National Service and in that case it might not be "reasonable and practicable" for the employer to reinstate both men; in that case he would be bound to reinstate the man first called up. The applicant for reinstatement has the responsibility of applying for reinstatement before the fifth Monday following his last day of whole-time service or, if he enlisted on or after 1st January, 1947, before the second Monday. In order to deal with disputes which may arise over reinstatement, a special committee has been set up and applications may be made to this committee through the local employment exchanges.

The National Service man who cannot or does not wish to claim reinstatement has two alternatives: to find himself a job or to take advantage of one of the Government training schemes. These come under two main headings: the Gov-

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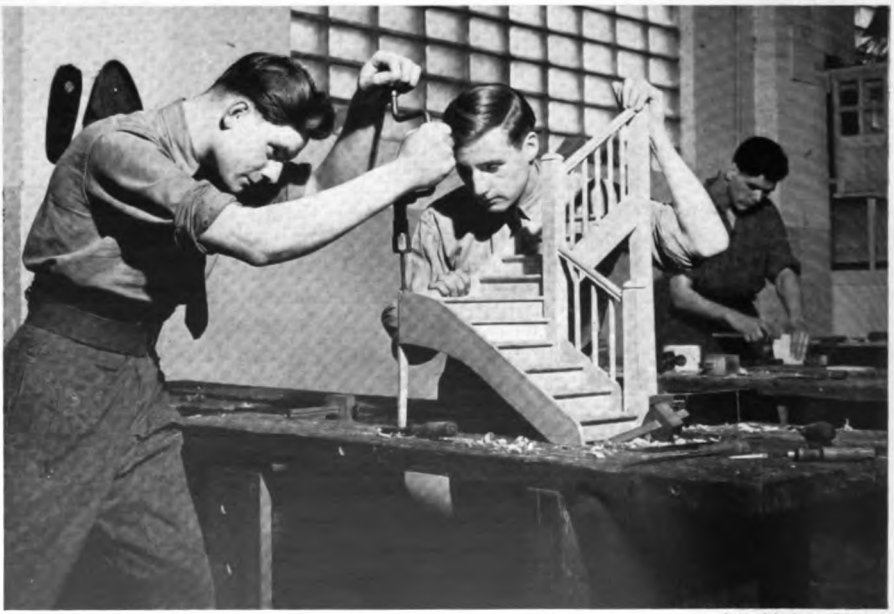
Market Gardening. An instructor, with his class of airmen, goes through the theoretical side of tomato growing before they go into the gardens to do it practically



[*Air Ministry Photos*

Carpenter's Shop. Two airmen busy making a model staircase

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ernment Vocational Training Scheme and the Further Education and Training Scheme. The former has been mentioned in conjunction with the resettlement of Regulars: it is intended to "assist the permanent resettlement of men and women whose training or occupation was interrupted by war service, by providing training courses in a large variety of skilled manual trades and black-coated occupations in which trained workers are in demand." It also applies to those personnel who had been employed previously in unskilled work but who, with the help of one of these courses, could become skilled workers. Training is given in a variety of trades connected with major industries, e.g., agriculture, civil engineering, clerical and commercial occupations, etc. The courses are normally of six months' duration and are held either in Government training centres or technical colleges, although in some industries the training is given by individual employers. Reasonable allowances are payable to persons in training under the Government Vocational Training Scheme, a detailed list of which appears in the appropriate Ministry of Labour pamphlet, P.L.156.

The Further Education and Training Scheme was inaugurated to help those people whose National Service interrupted their education or training for a business or professional career. An applicant for training under this scheme has to show that by reason of his service he

(*a*) has been unable to start training for a career; or

(*b*) has suffered interruption of training for a career; or

(*c*) is unable to resume his previous career; or

(*d*) requires a refresher course to enable him to follow up his previous career.

The criterion in selecting an applicant is whether he is likely to be capable of completing with credit the desired course, which will consist normally of whole-time training at a university, or other educational establishment, or training in a profession where practical as well as theoretical training is given. Normally the successful applicant will receive an award to cover the approved fees incidental to the course, together with an additional payment to cover maintenance, normal travelling expenses and, where applicable, marriage allowance; but the grant of an award under this scheme is in all cases subject to financial necessity.

The majority of National Service men, then, are eligible for either reinstatement or Government training. There will be those, however, who cannot, or do not desire to, take advantage of these schemes. Usually such people are sufficiently independent and resourceful to secure employment for themselves, but for those who fail to do so, there are available the normal facilities of the Ministry of Labour, plus the assistance given to ex-Service men by the voluntary organizations; in 1948, for instance, the Regular Forces Employment Association, in spite of its name, found employment for over forty thousand non-Regulars. Then, again, there are plenty of opportunities for able, young men in the Dominions and Colonies, and, of course, in His Majesty's Forces. The important thing is for the National Service man, who has decided not to return to his former employment, to decide early in his Service life what he wants to do when he returns to civilian life and to prepare for it while still in the Service, not to drift along haphazardly until the day of his demobilization and then to start thinking of the future. A great deal of literature has been published to advise the National Service man on resettlement; all the pamphlets mentioned in this article are held on R.A.F. stations, normally in the information room, and if they are used intelligently they provide a valuable guide to the road back to "Civvy Street."

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III : HINTS ON CIVIL EMPLOYMENT

Finally, the following hints are reprinted by courtesy of the Regular Forces Employment Association from their annual report for 1949 :

(1) Don't under- or over-estimate your value.

(2) Don't expect to start at the top.

(3) Don't turn down a job because of an apparently low starting wage. When you have accumulated skill and experience higher wages will follow.

(4) Begin a long time before you leave the Service to think about what work you want to do when you come out and prepare yourself by reading, etc., while still serving. For instance, there are many more applicants for driving vehicles than there are jobs; clerks without knowledge of typing or shorthand also are unwanted in any quantity.

(5) Try to find out what openings there are in your home area and choose the kind of work you want accordingly. With the present housing shortage it is probable that you will not be able to move, especially if you have a family.

(6) Keep up your educational standard. Don't allow yourself to get rusty in mathematics or spelling, for instance. Many a good job is lost by failure to pass a simple educational test.

(7) When on leave while serving, call and see your local job-finder. He will let you know what labour conditions are like in your area.

(8) When told about a job go after it at once. You may not be the only one who knows about it. If you delay you may lose it.

(9) Consider such jobs as the Post Office. It assures adequate wages, security, good prospects and a pension. Don't be misled by high wages in jobs of uncertain duration.

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GLIDING AND SOARING IN THE ROYAL AIR FORCE

By Squadron Leader Derek Dudley Martin,
O.B.E., F.R.Met.S., A.R.Ae.S.

IT is undeniable that there is widespread interest in gliding throughout the R.A.F. The reason for this interest is not difficult to understand; it springs from the knowledge that the R.A.F. is a flying Service, and from the ambition of even the lowliest airman to fly. To the majority of those in the R.A.F. flying is impossible, and, although they may manage to get the occasional flight as passengers, Service pilot training is out of the question. For financial reasons flying courses with civilian clubs are out of reach of the average airman and in any case the Service will accept no liability should a man be injured whilst flying with civilian clubs. It was with the object of putting flying within the reach of everyone in the R.A.F. that the Royal Air Force Gliding and Soaring Association was formed. Experience in Germany has indicated that there is a need for such an organization through which non-aircrew members of the R.A.F. may be taught to fly.

Quite apart from the recreational value, there are many advantages to be gained from gliding activities on stations. A unit gliding club affords a common meeting place for aircrew and non-aircrew, officers and airmen. The feeling that the airmen themselves are actually being encouraged to fly provides a stimulus to morale with consequential reactions upon unit spirit and on recruiitng. A unit gliding club offers an outlet for the active, and a place where knowledge can be gained by exchange between members.

In its more advanced forms, soaring offers the opportunity to investigate meteorological conditions which affect both powered and powerless flight. The power pilot who takes up soaring gains considerable knowledge of the element in which he operates—knowledge denied to those who rely upon machinery for their progress through the air.

Lack of mechanical assistance to flight ensures that the pilot is at all times aware of the elements, and his airmanship and general pilot ability must be of the highest order if he is to avoid an unfortunate landing when soaring conditions are absent.

These, then, are a few of the benefits which gliding and soaring can bring to the Royal Air Force. The R.A.F. Gliding and Soaring Association hopes to achieve its aim by the progressive realization of carefully considered plans.

Since the war, Service soaring has received additional impetus from the gliding and soaring clubs in the British Zone of Germany. There, using German equipment and sites, a standard has been achieved which is equal to, and possibly in advance of, anything achieved in that country before the war. B.A.F.O. (G.) clubs have been turning out glider pilots since 1945, and their *ab initio* trainees number thousands. Many members have left the R.A.F., but not a few have been sufficiently influenced by their gliding experience to remain in the Service on Regular or extended engagements. Many, having been posted from B.A.F.O. (G.), are anxious to continue their gliding and soaring activities in England.

The Association hopes shortly to commence flying at Detling, near Maidstone, Kent. As soon as flying is imminent, applications for membership of the Association will be invited through the medium of A.M.Os., but the actual flying will probably be limited to those with some experience of gliding.

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The reason for this limitation is that the R.A.F.G.S.A. wants to assist in the formation of unit gliding clubs throughout the country, and it is considered that the best way to do this will be to train unit representatives to a reasonable standard, after which they will be capable of returning to their units to form a club there. As the Association settles down it may be possible to train members from the *ab initio* stage, but it is felt that in the early stages more benefit will be gained by concentrating on those with some knowledge, so that the formation of unit clubs can go ahead as fast as possible.

For the ordinary Service man who wants to learn to fly, the unit gliding club will, it is hoped, provide the necessary facilities. If there is no club in his unit he will join the nearest unit club. If the unit club is affiliated to the R.A.F.G.S.A. under the "Associate Club" scheme, the member will be entitled to associate membership of the R.A.F.G.S.A. at a cost of only 10s. per annum. Associate members are allowed twenty launches per annum at the R.A.F.G.S.A. site or camp, which should prove an attractive way of spending leave.

Unit clubs affiliated to the R.A.F.G.S.A. will have a say in running that body, which, in turn, will be the controlling body for all non-public gliding in the R.A.F. Through the R.A.F.G.S.A. unit clubs will be represented on the Council of the British Gliding Association, which is recognized by the Royal Aero Club as the controlling body for all sporting gliding in the United Kingdom.

The R.A.F.G.S.A.'s chief flying instructor is Flight Lieutenant R. C. Forbes—one of the half a dozen British holders of the F.A.I. Gold Badge for gliding. With pilots such as he, the G.S.A. hopes to take part in national and international contests.

The scheme is ambitious, and the question most likely to be raised is "Where do the money and equipment come from?"

Firstly, there should be no overheads. All the work, including maintenance of equipment, etc., will be done voluntarily by members in their own time. Also, it is hoped that air and other officers commanding will allow gliding clubs to use accommodation which is not being used for Service purposes.

The initial equipment of a gliding club (gliders, winch, retrieving car and a cable) will, it is hoped, be obtainable from surplus and obsolete R.A.F. and A.T.C. equipment. Gliders and associated equipment no longer of any use to the Service can be reconditioned by members for use in the unit clubs.

Actual money will be obtained by members' entrance and membership fees, and by flying fees. Command, group and station sports and welfare funds should provide a source of loan or grant to newly formed clubs, should the officers commanding decide that the unit club concerned be sufficiently deserving.

Men will not "live dangerously" unless they are sure that they and their dependants will be looked after should accident unfortunately occur. Gliding with the R.A.F.G.S.A. and its affiliated clubs is officially recognized as an organized sport, with consequent protection of members' interests should they sustain injury or death whilst so engaged—a state of affairs which statistics show to be a very remote possibility.

Here, then, is a wonderful opportunity. Given support and enthusiasm, gliding can become available to the men of the Royal Air Force. Constructive recreation can take place in the natural element of a flying service, launched with the help of the Royal Air Force Gliding and Soaring Association.

Details of the R.A.F.G.S.A. may be obtained from commands (see A.M.O. N1237/49) or from the Hon. Secretary, 310 Bush House (S.E.), Strand, London, W.C.2.

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ALASTREAN HOUSE*

A Highland Holiday for the R.A.F.

By Flight Lieutenant J. J. Harding

FOREWORD

ALL Britain knows how, when the House of MacRobert had given all the manhood it could, Lady MacRobert provided planes for other mothers' sons to fly. They were named "MacRobert's Reply," but were only part of that Spartan answer to Nazism, for the lovely home of the MacRoberts, then called the House of Cromar, was turned into a rest-home where aircrew could gather fresh strength for the bitter struggle. The place that should have been the home of the MacRobert boys, from which they should have guided the fortunes of their estate, became a place of healing for their comrades.

The work did not end when aircrew were no longer in need of this healing. An Air Ministry Order tells in cold, formal phraseology of the generosity that now allows officers and their wives to enjoy Highland holidays for "a song." This article attempts to portray in warmer words one such holiday in that lovely house, faithful copy of a French château yet somehow still in keeping with the Scottish scene, happy in its pinewood setting.

A HIGHLAND HOLIDAY?

Our 1949 holiday was once in grave doubt. I phoned Barbara from the mess one April evening to hear the bad news of plans gone wrong. August must be our time, because of school holidays, and we talked sadly of full-up hotels. My gloomy eye was caught, through the phone-box door, by a tiny card on the notice board, the modest advertisement of Alastrean House.

A casual "Care for a Highland holiday?" and her "Oh, how lovely if we could!" spelled the end of gloom, for that evening I wrote my inquiry and somehow the prompt reply confirming the booking made me confident. Never a doubt, as when booking at a strange hotel. No misgivings, but eager planning, map searching, sleeper booking.

THE JOURNEY

So to seven o'clock in the evening of 14th August, when the two of us left for the North and a country we had never seen. For the first holiday alone together since—oh, well, a long time, since our honeymoon.

We settled into our sleeper on the "Aberdonian," taking little interest in England slipping by but almost expecting to have the Border marked by Customs men; like Pepys, we were "with child to see any new thing." But we slept, to wake in some large station—I could see no name, but as we pulled out saw a spire that spelled Edinburgh and Scotland.

Before sleep came again a new rumbling in the train's music told of the Forth Bridge, and we peered anxiously to the tide below until safely over, then lights out and sleep.

A cheery call and cup of tea at half past six woke us to rain-wrack over a

*A composite word from *Alar Astre Astrean*, meaning "a place of honour by the hearth of the winged heroes of the stars."

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sea coast that looked like any other, and the approach to Aberdeen, whose title, "Granite City," we now understand.

The "Aberdonian" was running late, and our kindly conductor wrought a miracle to get us on the 8.5 to Aboyne. Poor us, we did not know the drill. Take heed, ye who follow. Have breakfast in Aberdeen, and catch the next train. However, excitement kept hunger bayed, and we sped empty to Aboyne, noting the curtness in the place-names, Scots and dour. And then the thrill as through the pine woods on either side we first glimpsed the Highland scenery and the heather.

Alastrean House

In pleasant Aboyne it was thirty minutes before Shands' bus took us on. We bought bannocks and doughnuts, hunger was so clammant, then, munching, explored a little of the trim, spotless town under clearing skies. Followed the short, pleasant trip to Tarland, and our first sight of the house. It lay to the right of the road, across a mile or so of fields, a château in the style of the Loire, with blue "candle snuffers." A backcloth of pines, a foreground of grass, and we had a picture we will remember. In Tarland's compact village square we changed to a taxi, an old, stately Rolls, in harmony with the place, and went upwards along a private road between rhododendrons and pines, to sweep into the crisply gravelled forecourt of Alastrean House, up to the porch that is a memorial to "the Few." It is fitting that it welcomes each visitor, for, though sentimental symbolism is unfashionable, that their spirit should be in that ever-open doorway is just right.

THE HOLIDAY

No bell peal. Squadron Leader Room and George were on the doorstep with their cheery greeting, and we were steered through a litter of game-bags, magazines and guns upstairs to our room. Mrs. Room came up, to make sure that all was well and to offer a balance for the missed breakfast. A wash, toasted scones and tea, then a stroll to explore, a wander through the gardens, over the front terrace to the edge of the nine-hole golf course. A breeze was whipping the clouds away, taking veil after veil from the hills around, their purple silhouettes changing as distant details appeared and the Highlands unfolded. We carried on down to the village, gladly stretching our legs, and returned along the lower road to a very welcome lunch.

After lunch we were shown the house, and told the few simple rules, all common sense and no bind. From billiard room to smoke room we wandered, admiring it all, liking the gay chintz and the crisp cream of the walls. So very, very little to suggest that this was other than the house of a hostess with a taste for comfort and us for chosen guests. We saw the stable of bicycles that solve the problem of how to get everywhere and anywhere but not spend a fortune on buses and cars; and the little guide book that tells each walk and drive around, timed to fit in with the house meals. Then picking a ride at random, machines with care, we set off for our first run.

Here a word on the bikes and cycling. Several of the machines are gifts to the house, the others ex-R.A.F.; none are ramshackle crocks, but all are well-serviced

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mounts, soundly braked and shod, fit for all the hills in the land, that sound engineering has made without terror. Walk up some you may have to, but not many; which is one of the surprises of Scotland.

In the days that followed our chosen steeds worked hard. They took us to Burn O'Vat and the Queen's View, to Dinnet, the Picts House, and the Druids' Circle. From them we saw Loch Davan and Loch Kinord, and they carried us near to high Morven. Only on the days that we shared a car with a kindred couple and went to Braemar and Strathdon did they rest.

For on every day we went some fresh way, to one of the beauty spots or places of interest. The first was Burn O'Vat, out past Loch Davan and Loch Kinord, with its little island. One had a castle from which forays were made in the old, dark days. We climbed up the peaty hill above the burn, and scrambled into the huge, glassy-sided pot-hole, where the waters endlessly whirl, then raced for home in soft showers, careless of them in our freedom.

In turn we sought the ancient cave-dwelling they call the Picts House, where huge granite blocks let no moisture in or secret history out; and the Queen's View, that favourite of Queen Victoria, from which she could see all the Howe of Cromar. Not high enough to reduce the landscape to an Ordnance map, lofty enough to give a view right down the vale, with high Craiglich to the left, Pittenderich to the right, flanking the busy, peaceful farmlands. Sturdy trees, fat cattle and weathered walls. A bright sun and a stinging breeze chasing cloud shadow over the fields.

Next the Druids' Circle, beyond Tarland to the south. Why this temple on the highest knoll in the Howe? Temple only or fort as well? Was it the rallying point of valley men against forays from beyond Braemar? Or a place of thanksgiving for harvest and hunt?

And Braemar, reached by bus ride along Deeside, where road and river wander hand in hand between towering hills; the one staid, prosaic, the other wilful, chattering. The heather glows, and the pines stand in haughty regiments, whilst at the head of the glen Lochnagar keeps watch. Tidy cots, trim gardens, busy hives—how lovely is heather-flavoured honey—fishers' huts on the river's banks, in all those miles of beauty the stretch of Cambus O'May is the loveliest.

Beyond Braemar we went, to the Linn of Dee, where the baby river forces a tempestuous way through and over the fencing rocks. We saw Balmoral, Crathie Church, and Ballater town, where is the Tweed warehouse. What temptation to buy there!—where tartans and tweeds, whose rough strength and soft texture are so like their makers and country, are displayed in plenty; and how we sought in vain for our names among those of families who may wear a tartan!

The Valley of the Don was visited, on the memorable day when we attended the Lonach Gathering, to see the clans march down from the hills in all the panoply of Highland chivalry. Kilted, bemedalled, brawnily stepping to the pipes, with ancient, tattered banners, they followed their chieftain to the games. How many clans were proclaimed by the tartans of the crowd, what subtleties were harked for in each pibroch played, we did not know; but we enjoyed that day.

The Highlands

Morven, Tarland's own mountain, was climbed after a hike up

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the burn that races to the Dee. We scared rabbits by the dozen; pheasants rose from the corn; every pool had its trout; at the summit a blue hare and a hawk were our company. But not mankind. It is lonely, wildly peaceful, on Morven.

We climbed the moor behind Leadlich with the guns, crossed to Craiglich, saw all our holiday kingdom below us, from Mount Keen to Aboyne Castle, with the house just below, tree-girt and serene.

Serenity is the keynote in that valley, for all the fierceness of Nature. Serenity and conscious ability to live a full, contented life. And in Alastrean this serenity may be enjoyed and absorbed.

Always we felt so free on that holiday, in or out of the house that was our home from the first. It welcomed us from each trip with a meal, and how we punished those scones, toasted and honeyed, in the billiard room each day! Were we wetted—and we often were—the drying room awaited our clothes, a hot bath ourselves.

The house did not chase us out; it offered croquet or putting did we seek gentle exercise. Had we been golfers—we were tempted to learn—the golf course was beside it. A lazy hour in the tiny Italian garden was ours on the Sunday, and it sufficed.

Of an evening the smoke room was the hub of life. There a log fire, August notwithstanding, a pint and much "shop." Or Alastrean rummy, or there was the "cinema" with shots of the house and its visitors.

THE MACROBERT

And now for an Alastrean tradition. Lady MacRobert lives there no longer, but has gone to Douneside, a smaller house up on the hill. But most evenings she dines at Alastrean, and holds brief court over coffee in the billiard room. There we met her—or were presented, for she is a true laird.

This is a most pleasant custom, for, having lived a day in a house that is as it was lived in by the family, it is good to meet the laird in person. It brings to light the spirit that is behind this year-long Highland house party.

Of Lady MacRobert, in brief we both agreed that she is a master will in soft wrapping. Her femininity is regal, her queenliness most friendly. Her keen brain knows all the vast estate that is centred on her, yet there is no hardness in her bearing. Her generosity is utterly without patronage, and one thanks her with pride that such people are among us.

Of course, we were not her only guests that week. An air vice-marshal led the shooting party of seven eager folk, from whose talk we learned more of the hills and heather than guide book ever told. And another two-ringer and his wife came half-way through to join us in our haunts. But had we had the house to ourselves, or had it been crowded to the doors, the atmosphere would still have soaked in until we felt we owned Alastrean and all its pleasuances.

THE RETURN

Of the journey home, nothing. It was to our own most pleasant way of life, and we left behind a house to which we will return, and which echoed our hostess when she said "We hope to see you next year." We had visited what was a shrine to those who died, to find it a house of the living. A generous, gallant gesture, a challenge and a haven. That is Alastrean House.

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AIR FORCES FORUM OF DISCUSSION

(*Write to the R.A.F. Quarterly about it*)

LETTERS TO THE EDITOR

AIRSHIPS

LINDSAY HALL,
LINDSAY ROAD,
BOURNEMOUTH, W.
26th January, 1950.

DEAR SIR,

I am surprised that you have never had anything about airships in THE ROYAL AIR FORCE QUARTERLY, especially considering the fact that before the last war was over the R.A.F. invited American airships to come to England to help them in the war against the new "snorkel" type of U-boats.

I have recently been over to America, and have spent some time on various airship stations and was struck by the fact that immense faith is put in the non-rigid airship as one of the best craft for the detection of submarines.

Since the war great strides have been made by submarine designers, but the airship designers are keeping pace with them and comparative tests have shown that for detection purposes the airship beats all other aircraft.

It is a well-known fact that in two world wars no convoy escorted by an airship has been successfully attacked by a submarine. The airship, in fact, is the perfect goalkeeper. Bearing this in mind, it seems tragic that we refuse to recognize the merits of the airship, which served us so well in the First World War, and served our American allies equally well in the last.

The modern airship, inflated with helium gas, is much less vulnerable than the ones we used in 1914-18, when hydrogen airships were used from Dover, within a very few miles of German-occupied Belgium. In those days the ships could easily be set on fire and the crews would have been lost with their ships, as indeed happened on two occasions with our own naval airships. Now, thanks to helium gas, even if the airship is destroyed, the probability is that the crew would survive.

The modern airship, with a speed of nearly 80 m.p.h. and the ability to stay in the air for a week without refuelling, as was proved by the fine flight of the American airship XM1 in 1946, with its car loaded with electronic devices for the detection of submarines, is a very vital weapon. We surely, as an island power, dependent on the sea for our supplies, should study this question with open minds and without prejudice.

Yours sincerely,
VENTRY.

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1st *February*, 1950.

"DESTROYER AIRCRAFT"

DEAR SIR,

I wonder if I, as an anti-aircraft gunner, might make a comment on an article appearing in your January issue? I refer to the article on "Destroyer Aircraft" by Group Captain Walker.

One of the main arguments against ground defences for A.A. work has been their short range and poor accuracy, coupled with comparative lack of mobility.

The advent of the rocket has, however, somewhat altered matters. With modern radar and predictors a rocket missile could be placed sufficiently near its target for a "homing device" as envisaged by Group Captain Walker (and, I believe, incorporated in the air-to-air Ryan "Firebird") to take it into the kill. A proximity fuse would make certain of a "near-miss" at least.

The range would still be very limited, but with this type of missile a range of from twenty to thirty miles should be quite practicable, which would be sufficient to provide complete coverage of the comparatively concentrated targets in the United Kingdom without stretching the man-power position too far.

While I would not for a moment suggest that this would do away with the need for fighters—both air and ground defences are indispensable—I would suggest that the weapons I have outlined would have at least these advantages:

(*a*) They would not require a valuable aircraft and its highly trained pilot, thus releasing them for offensive action.

(*b*) A rocket can climb faster and more steeply than a plane and therefore a bomber could be engaged much more quickly in the event of a surprise attack.

(*c*) Single targets would be attacked with less waste.

(*d*) As Group Captain Walker says, an aircraft is open to attack by escorting fighters. A ground position is not only a much harder target to attack but is also much easier to defend.

Yours faithfully,

RALPH L. SHEFFIELD.

DEAR SIR,

Before pouncing on Group Captain Walker's plea for "Destroyer Aircraft with Satellite Rockets" (January, 1950, issue of the QUARTERLY) I should like to put on record that I consider it far better to have a bad idea than to have no idea at all.

The article is certainly a wonderful mixture of presumptions and fallacies and even if the presumptions proved correct the fallacies render the arguments unsound. Group Captain Walker lets his idea get too vast and complicated and, in places, his imagination gets the better of his reason.

For example, he writes: "The principal foundation for proposing such a method of carriage is based upon the fact that two opposing forces can reach a state of equilibrium." True, but the following statement—"If the aircraft has a repelling force emanating artificially from it and the missile has an attraction

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towards it a state of equilibrium will be achieved"—is certainly not true. Also acting on the missiles would be a very persistent and effective third force—apparently conveniently ignored—due to the gravitational pull of the earth! So the "principal foundation" for the method of carriage is unsound, even if it did prove possible to produce the "artificial repelling force" required. (Incidentally, what is wrong with ordinary radio control for the missiles?) Such devices rarely exist even in the vivid imaginations of the most ardent science-fiction writers, and as far as can be foreseen an "anti-gravity" force is quite impracticable.

A major presumption for the success of Group Captain Walker's destroyer aircraft is that the enemy bombers will come over closely packed together, as shown in the illustration heading the article or in the massive fly-pasts depicted during the closing scenes of some super-colossal American air epics. Even during the war-time concentrated raids of Bomber Command the bomber force occupied several cubic miles of space. Present indications, surely, are of small numbers of widely spaced atomic bombers each making for the nerve centres of our industrial power.

Even if the bombers did come over as required, the claims for Group Captain Walker's homing missiles seem gross exaggeration. "Seven hundred aircraft" or "2,400 aircraft destroyed before the coast is reached" would be some achievement! Group Captain Walker says: "The surprise of these tactics at the beginning of a war would have a tremendous moral effect because the attack would be over in about a minute and a half without giving the bombers much chance of retaliation." "Tremendous moral effect" is a masterpiece of understatement, even if the attack lasted much longer than the estimated minute and a half. Such a result would, if nothing else, make redundant a large number of ground crews behind the enemy lines.

Just how the homing mechanism on Group Captain Walker's missiles would differentiate between one enemy bomber and another, to prevent them from all making for the same one, is not at all clear.

The cradle required to launch a destroyer and its constellation simply staggers the imagination, particularly if a few pencil sketches are made of the sort of thing that would be required. Even bigger and more awe-inspiring would be the encircling framework needed for loading the missiles into their respective launching tubes in the cradle! "Glorified flying-bomb launching base" it would be and then some.

Despite these criticisms, however, there is much to commend the basic desire of Group Captain Walker—to effect a big increase in the destructive power of defending fighters. The Germans with their X-4 rocket missile guided from an accompanying F.W.190, and the multiple rocket armament of the "Natter" target defence interceptor, already had similar ideas seven years ago. Developments of these two projects should lead to something practicable and effective.

Still, the belief of the writer is that if we are going to wait until enemy atomic bombers are on their way we will have waited too long and it will then be too late. Our intelligence service should be able to give prior warning of an aggressor's raid, which should then be prevented from materializing at all costs. As Group Captain Walker says, "the preventing of a really heavy bombing raid is something that merits deep thought." The prevention of the first raid of all merits even deeper thought.

MAURICE F. ALLWARD.

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EDUCATION AND SELECTION OF OFFICERS IN THE R.A.F.

8th February, 1950.

DEAR SIR,

In reply to my letter prompted by certain articles on education and the selection of officers in the Royal Air Force, Squadron Leader Pentono-Voak writes: ". . . but, whilst agreeing in principle with most of his comments, I do not think we place undue emphasis on technical instruction in the R.A.F. . . . etc."

No one is suggesting that too much emphasis is placed upon technical training. Few things could be more evident today than that the highest technical (in the sense used by your correspondent) efficiency in the air, whether in equipment or training, is a dominating factor in the security of our country, Commonwealth and Western civilization.

To turn from the general statement in my first letter to a particular interpretation, I say that you can have as much technical training as you like, but this must not be at the expense of those human characteristics which make leaders in war. Technical proficiency of itself is not enough. I add that when we approach the public schools for potential officers we should lay greater emphasis upon the need and scope for the boy of well-developed character and mental powers rather than the need for technical aptitude. Technical qualifications are necessary in due degree according to the branch of the Service, and the higher these qualifications the better. But above this there is the more fundamental need for those qualities amongst officers in all branches of the Service which elevate them from being mere "man managers" to becoming "leaders." The difference is the difference between a "shop-walker" and an "officer." What is more, we must see that the conditions exist in which those qualities can flourish.

Yours faithfully,

J. R. GORDON-FINLAYSON, *Wing Commander*.

"A TANGLED TALE"

19th January, 1950.

DEAR SIR,

I regret to say that either an error on my part or a misprint has occurred in "A Tangled Tale" in the January issue of the QUARTERLY. On page 34, paragraph 1, line 4, the name "Brown" should be inserted after Robinson. On page 92 (solution), in paragraphs 1 and 5 the time should be 2300 hours in each case (or 11 p.m.).

You may assure irate readers that "H. R. P. P." has now put himself behind bars (four-ale), where he will be very hard to find.

Yours sincerely,

H. R. P. PATTERSON.

[It was *not* a misprint!—ED.]

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THE AIR FORCES IN PARLIAMENT

WESTERN UNION AND AIR DEFENCE

IN the course of a general debate upon "British and Western Union Defence" in the House of Lords on 9th November, 1949, attention was drawn to many points which are relevant to the functions of the Royal Air Force and Commonwealth Air Forces.

Viscount Templewood said that since the previous debates on defence in that House there had been several momentous changes in the world, in particular (1) the admission that Russia now possesses and produces the atomic bomb; (2) the Communist sweep over China; and (3) a series of crises in Central Europe and the Balkans. In spite of these changes there was, he said, a curious apathy in the country which he attributed to the failure of the Government to take the people into their confidence. The Leader of the House had said on a former occasion: "The Royal Air Force is, without a doubt, our greatest safeguard in war, so far as we can see, and I believe it is our greatest safeguard in peace." On that account he took air power as the chief subject of his remarks.

Asking (1) how far they were providing an effective quota to Western defence and (2) how far the Brussels and Atlantic Powers were agreed upon a common strategy, the speaker pointed out that the R.A.F. was "essentially a trained and skilled Service needed for instant action" and that "highly trained Regulars must be its background." What was the present position? The R.A.F. amounted to 204,000 (excluding the W.R.A.F. and the R.Aux.A.F.), and of these, 114,000 were long-service Regulars and 90,000 short-service National Service men; thus nearly half the Service was composed of young, short-term conscripts, and the number of long-service Regulars was running down. Meanwhile Regular recruiting was going from bad to worse; and the R.Aux.A.F. was more than 80 per cent. undermanned. To improve recruiting he suggested better living conditions, a more assured career for Regulars when they leave the Service and extra pay for flying risks. The C.A.S. (Lord Tedder) himself had said, at his summer conference: "It is completely out of date to say, as many people do, that there cannot be satisfactory recruiting for the Royal Air Force when there is full employment."

Turning to his second question, that of a common strategy, Lord Templewood said that, as a result of muddled diplomacy between the wars, Germany acted outside the comity of Western Europe and created a great army and air force of her own, and he warned them that there was a risk of the same thing happening again. He already saw the German demand for equality of status gaining power, as well as the insistent French demand for security. If, as he hoped, they were eventually to bring Germany into the orbit of Western Europe, it was essential that they should be able to reassure the French that Anglo-American strength was so great, particularly in the air, that the risks of aggression, either from Germany or from Russia, had been reduced to a minimum.

Summing up, (1) he asked for a great effort to make effective what the United States called "readiness potential," particularly in the air; (2) he suggested that efficiency should be improved in the Air Force by a greater reliance on skilled long-service personnel and less reliance upon a great intake of National Service young men; (3) he pointed out how the necessary economies could be found

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from savings on the National Service intake; (4) he called for an immediate review of the German problem, in view of the changes in Europe during the past five years, and for a serious attempt to draw Federal Germany step by step into the Western orbit; and (5) he appealed for an effort to reassure the French by an overwhelmingly strong Anglo-American air force and the fullest development of Western Union defence against possible German aggression in the future.

The Marquess of Reading observed that the signing of each new pact or agreement was followed by the creation of a new and apparently separate staff, and he asked whether there is not, "to put it mildly, a grave risk of duplication between this multiplicity of staffs"; and "To whom are these various staffs responsible?" Regretting that the House knew so little of what was going on, he also feared that the armed forces were not properly balanced, and that the spearhead of an efficient striking force was handicapped by a too heavy shaft of administrative personnel. The problem of a balanced force was one of the most difficult to solve and at the same time one of the most essential for solution, particularly in these days of limited effective man power.

Lord Strabolgi said he always understood that the Chiefs of Staff Committee in Washington was the supreme body and that all other international staffs were responsible to it. But he feared the whole thing was rather a façade because there was no real force as yet behind those staffs. Nevertheless, he stated his belief that "technically the Royal Air Force today is ahead of any other in the world"; and he said that the staff of the R.A.F. seemed to have "escaped the blight of the military mind." Considering the dangers of aggression in Europe, he said that Russia was a satisfied Power with immense national resources and land areas which she wished to develop and exploit; whereas Germany was a disgruntled Power, resenting the imposed eastern frontier, the long delay in making the peace treaties and the long years of occupation. For that reason he hoped that the Germans would not be invited to play a part in Western Union Defence, and would not be allowed to rearm—"that would be madness."

Viscount Trenchard also called for more publicity in the country on the necessity for efficient defence; and he quoted Admiral Mahon, who had said: "Free peoples object to paying for large military establishments." Demanding an overwhelming Air Force, he quoted Lord Tedder's recent speech in which he had said that "in war nothing on the surface of land or sea can operate effectively unless and until the situation in the air is under firm control"; and, again: "The most immediate and the most dangerous threat would come from the air, and the trouble is that that threat can develop a great intensity so rapidly. The time factor is vital and the inevitable unpreparedness of the democratic countries has in the past often proved to be an irresistible temptation to an aggressor." Referring to the atomic bomb Lord Trenchard said that all wars had been won in the final stage by fire power, and what was the atomic bomb but superior fire power. They should be prepared to say *now* that if the threat from the East materializes they would at once hit with the atomic bomb!

Lord Balfour of Inchrye doubted whether Germany was purged of the virus of conquest and belief in war as a means of settling disputes. He also hoped that this country would retain a balanced Air Force of bombers as well as fighters, because the bomber force was just as much a part of home defence as the fighter force. "We cannot," he said, "abdicate to any of our allies our ability first to go to war when we have to—and we could not go to war unless we had a bomber striking force—and, secondly, the power of conducting and directing a war in the way we and our Chiefs of Staff consider best."

—*"Hansard," H. of L., 9th November, 1949.*

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CURRENT EVENTS

UNITED KINGDOM

King and Queen will attend R.A.F. Display, 1950

THEIR MAJESTIES THE KING AND QUEEN have graciously consented to be present on Friday, 7th July, at the Royal Air Force Display of 1950, which will be held at Farnborough. The Display will be repeated on the following day, Saturday, 8th July.

Reorganization of the Air Staff

The Air Ministry announced on 9th February last a reorganization of the Air Staff to take effect on 1st March. It was to be divided into two main groups, one under a new vice-chief and the other under a new deputy chief, both of whom are to be members of the Air Council and each to be directly and independently responsible to the Chief of the Air Staff.

The new Vice-Chief of the Air Staff is Air Chief Marshal Sir Ralph Cochrane, who was Air Officer Commanding-in-Chief, Flying Training Command; and the new Deputy Chief of the Air Staff is Air Marshal Sir Arthur P. M. Sanders, who was vice-chief before the change.

The department of the vice-chief is mainly concerned with the strength and fighting efficiency of the Royal Air Force; while that of the deputy chief is mainly concerned with inter-Service policy and planning and with co-operation with Commonwealth and allied Air Forces.

The principal reasons for this reorganization were: (1) pressure of work arising from international commitments, e.g., Western Union, the North Atlantic Treaty and the Brussels Treaty; (2) the need for economies in man power in the Air Ministry; and (3) new problems created by the introduction of new types of aircraft into the R.A.F.

Other senior appointments arising out of this reorganization are: Air Marshal Sir Hugh S. P. Walmsley to be A.O.C.-in-C., Flying Training Command, with effect from 1st March; and Air Marshal Sir Aubrey B. Ellwood to be A.O.C.-in-C., Transport Command, with effect from 31st March.

Thirty Years of Cranwell

The Royal Air Force College, Cranwell, is thirty years old this year. It was opened on 5th February, 1920, under its first Commandant, Air Commodore C. A. H. (later Air Vice-Marshal Sir Charles) Longcroft.

Of the thirty-four surviving graduates of the first entry, twenty are still in the Service. Seven of these are now air vice-marshals, six are air commodores and seven are group captains. The air vice-marshals are N. H. D'Aeth, G. R. C. Spencer, C. W. Weedon, W. A. D. Brook, G. Combe, G. H. Mills and F. G. S. Mitchell. When the war broke out, just over a thousand officers had graduated at Cranwell; and during the war Cranwell-trained officers gained 599 awards and decorations, including one V.C. (Wing Commander Hugh Malcolm) and three George Crosses.

The names of all those who have passed through the gates of Cranwell are recorded in a volume which is one of the most highly prized possessions of the Royal Air Force College.

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Aerial Survey of Britain's Urban Areas

(Extracted, with acknowledgments, from an article by "The Times" Aeronautical Correspondent)

A little-known but very important function of the Royal Air Force is co-operation with the Ordnance Survey in a great map-making project that will take from twenty to thirty years to complete. This "combined operation" is no less than surveying from the air and mapping, on a scale of fifty inches to the mile, all the more important urban areas of England, Scotland and Wales.

Map makers for many years have been shy of using aerial photographs from which to plot their maps, particularly those of a very large scale; but their reluctance has now been largely overcome, and the advantages of aerial surveys over those carried out with chain and theodolite on the surface are now generally recognized.

The R.A.F. is also co-operating with other departments, e.g., the Ministry of Town and Country Planning, and the Department of Health for Scotland, in producing large-scale maps based on aerial surveys. Requests for aerial surveys, by these and other bodies, are made to the Air Ministry, where they are co-ordinated and passed to the R.A.F. Central Photographic Establishment at Benson, which at present carries them out.

Ansons are generally used for work below 9,000 feet and Mosquitoes or Spitfires at higher altitudes. Every day the crews attend a "met" conference, at which the day's flying is planned (or cancelled) according to the weather, and the crews are briefed. To ensure the greatest flying accuracy, which is essential, a radio Decca navigator is used. An officer of the Ordnance Survey is permanently stationed at Benson, so that liaison between the Central Photographic Establishment and Ordnance Survey Headquarters at Chessington, Surrey, is as perfect as may be.

Weather is, of course, the greatest obstacle. Suitable aerial photographs can be obtained only when the sky is cloudless (thus avoiding cloud-shadows) and there is neither ground mist nor industrial haze. Some industrial areas are still unphotographed because of this industrial haze, which, when they are not creating it themselves, drifts over from neighbouring towns. It is also very difficult to obtain good photographs of the lowest tide-marks around our coasts, even with the infra-red filters used; for periodical very low tides often occur at night or when the daylight has not sufficient actinic value, and haze and mist are very common in coastal districts.

Standard Cockpit Control Knobs

In order to simplify the work of the pilot, which has become more and more exacting with the development of increasingly complex aircraft, all new aircraft designed for the R.A.F. from now onwards must incorporate cockpit knobs of standardized shapes.

The effect of this decision will, however, not be seen for some years, when aircraft now in the development stage reach the squadrons.

In future the major control knobs in the cockpit must be of distinctive specified shapes instead of shapes selected by the aircraft manufacturing firm. Thus all flap control knobs will be uniform-sized spheres with small, cylindrical projections each side, the supercharger control will be a three-quarter-inch cube, and the mixture control will be a disc with small pyramids on the rim. These shapes, and those for other controls, were selected after a series of tests conducted by the R.A.F. Institute of Aviation Medicine to find those which could readily

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be identified by feel alone. Emergency controls, such as those working ejection seats or fire extinguishers, will have diagonal yellow and black stripes to make them more conspicuous.

The main benefit resulting from this standardization will be that whatever type of aircraft a pilot has to fly, he will know that a control knob of a particular shape performs a particular function. At present most aircraft knobs are spherical and give no indication of what will happen when they are moved. One effect of the change will be to reduce the risk of accidents caused through a pilot moving the wrong knob by mistake.

Hirst Scholarship (Marlborough)

The next examination for the Hirst Scholarship at Marlborough College will begin on 31st May, and applications must reach the school by 10th May at the latest. This scholarship was founded by the late Lord Hirst in memory of his only grandson, Pilot Officer Hugh Harold Hirst, an Old Marlburian, who was killed while serving in the R.A.F. with Coastal Command in 1941. It is reserved for sons of officers or ex-officers of the R.A.F. and entitles the holder to a reduction of £50 a year in school fees. The age limit is 14 on 1st June in the year in which candidates sit for their examination.

New Wrist Watch for Navigators

A new highly accurate wrist watch, the Mark II Navigator Wrist Watch, has been introduced into the R.A.F. for the exclusive use of air navigators. The movement of the watch is housed in a water-tight stainless-steel case embodying an inner screen of soft iron; it is therefore unaffected by tropical conditions, high altitudes and strong magnetic fields. The dial is black with luminous markings and the hands are also luminous. A brake on the balance wheel stops the movement when the winding button is withdrawn to set the hands, and this makes accurate synchronization easy.

R.A.F. Trophy for Royal Egyptian Air Force

As a symbol of friendship and good wishes, the Royal Air Force has presented a silver trophy to the Royal Egyptian Air Force for inter-squadron air-firing and bombing competitions to be held by the R.E.A.F. The trophy, a fine example of British craftsmanship, is a sterling silver model of an eagle in flight.

* * * *

FAR EAST

Tour of Inspection

Before taking up his new appointment as Chief of the Air Staff, Air Chief Marshal Sir John Slessor made a wide tour of inspection of Royal Air Force units overseas.

In the illustration he is seen inspecting a guard of honour mounted by No. 93 Squadron of the R.A.F. Regiment (Malaya) on the occasion of his visit to the R.A.F. Maintenance Base (Far East), Seletar, on Saturday, 12th November, 1949. Beside him is the officer in command of the guard of honour, Flight Lieutenant J. H. Thacker (King Street, New Buckenham, Norwich), and in the rear is Air Commodore H. J. G. E. Proud (Base Commander). Is it our fancy, or has the Air Chief Marshal noticed that that sergeant is very slightly out of alignment?

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Air Chief Marshal Sir John C. Slessor, G.C.B., D.S.O., M.C., inspecting a guard of honour in the Far East just prior to taking over his appointment as Chief of the Air Staff. (See "Current Events—Far East")

Operations in Malaya

Operations in Malaya, in which the Royal Air Force are acquitting themselves with great credit, continue. Personnel face the hardships of this campaign with a stoicism, almost cheerfulness, that is worthy of the highest traditions of our Fighting Forces. Early this year in thirty-one days a record number of fifty-eight air strikes, involving 328 offensive sorties, were flown by Spitfires, Tempests, Harvards, Beaufighters and Sunderlands. Royal Naval Seafires and Fireflies of H.M.S. *Triumph* took part in three air strikes. Fifty-seven of the sorties were flown in fourteen consecutive days, when continuous air support was successfully given to security forces operating in Central Johore. In one case less than two hours elapsed between the call and the firing of the first rocket over the target.

The total amount of supplies dropped by R.A.F. Dakotas in the operations now exceeds two and a quarter million pounds.

The effort behind the above is obviously prodigious, yet the assessment of the value of air strikes given recently by an R.A.F. spokesman at a Press conference in Kuala Lumpur could hardly have been less modest. His conclusions were as follows:

(*a*) Air strikes have undoubtedly caused many casualties, though definite confirmation is very difficult to obtain.

(*b*) The material damage caused by air strikes is negligible.

(*c*) The moral effect of air strikes on bandits is very great. Gangs are broken up, moved from areas in which they have established local control and adequate food supplies, and often driven into ambush positions prepared by security forces.

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GERMANY

Presentation to R.A.F. Station, Gatow

In appreciation of their comradeship during the Berlin air-lift, the Army Forward Airfield Supply Organization at Gatow has presented R.A.F. Station, Gatow, with an oak shield bearing the badge of the Royal Army Service Corps.

Lloyd's Cup Rifle Competition

No. 54 Rifle Squadron, Royal Air Force Regiment, has won the Lloyd's Cup for rifle shooting. The cup was presented to the R.A.F. Regiment in 1943 by the Committee of Lloyd's (Underwriters) to encourage a higher standard of rifle shooting. The winning squadron, which is based at Luneberg, Germany, is commanded by Squadron Leader S. J. Furneaux; and 90 per cent. of its personnel are National Service men. The best individual score was returned by A.C.2 Alfred Smith, a 19-year-old National Service man.

Education Section, R.A.F. Station, Gatow

The Education Section at R.A.F. Station, Gatow, Berlin, has moved to larger premises. The new building contains facilities for handicrafts, leatherwork, metalwork, aero modelling, art, music, private study and radio listening. A special library and study room have been set aside for officers preparing for their promotion examinations.

* * * *

FRANCE

Ski-ing Holiday at Chamonix

Ten officers and thirty-three cadets from the R.A.F. College, Cranwell, enjoyed a fortnight's ski-ing holiday at Chamonix in France last December. This trip was the second of its kind. During the previous winter a party spent a fortnight at Schmeltz, in Austria.

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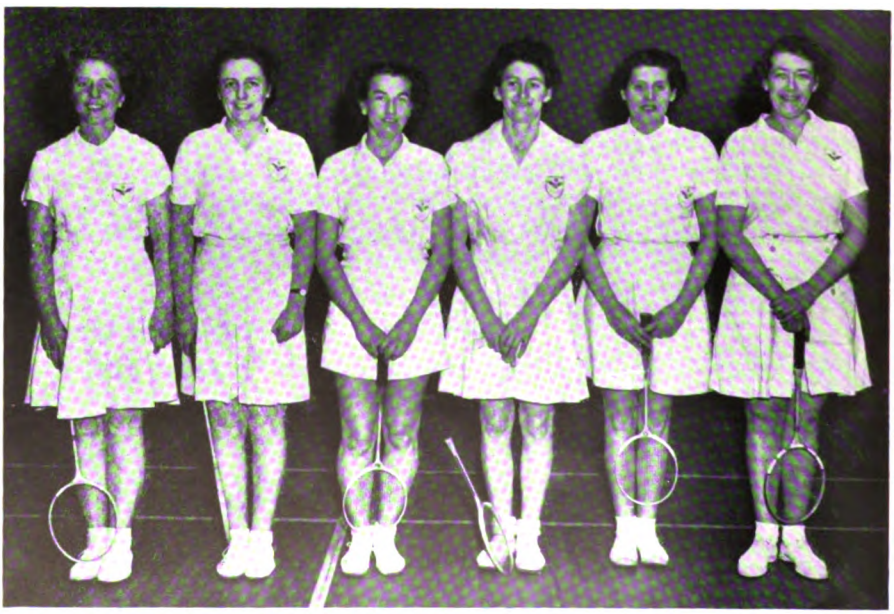
[*Air Ministry Photo*

Just before knocking out his opponent, A.C. Ratcliffe, R.A.F., carries the fight to his bigger and taller opponent, Ake Stenberg



W.R.A.F. Badminton Team

Left to right: *Flight Officer Yeomans, Flight Officer Fernihough,* ***Flight Sergeant*** *Osbourne, Sergeant Parsons, Flight Sergeant Nutt and Pilot* ***Officer Jenkins***

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SPORT IN THE R.A.F.

By J. Sephton

BADMINTON

At the R.A.F. and W.R.A.F. Individual Championships, which were held at the beginning of 1950, the play was of a very high standard and all matches were keenly contested.

Among the fifty-two entrants for the 1950 R.A.F. Singles Championship was last year's champion, Flying Officer Tew, who was beaten in the semi-final by Flight Lieutenant Cussen, who went on to win the title by beating Flight Lieutenant Marland in the final.

In the final of the Open Doubles Flight Lieutenant Marland and Sergeant Goode were the winners, their opponents being the 1949 champions, Flying Officer Tew and Squadron Leader Murphy.

The Inter-Station Pairs Competition was won by R.A.F. Station, Leconfield, represented by Flight Lieutenants Cussen and Kingsford.

[*Sport & General, London*

Flight Officer I. Yeomans, winner of the W.R.A.F. Badminton Singles and Doubles. Partnered by Squadron Leader Murphy she also won the W.R.A.F. and R.A.F. Mixed Doubles at the Wimbledon Squash and Badminton Club earlier this year

The R.A.F. Inter-Station Competition, for which a record entry of eighty-five stations was received, was for the Sergeant Tait Trophy, presented by the mother of the late Sergeant Tait, a fighter pilot of No. 112 Squadron who was killed in action in the Middle East on 18th January, 1940.

The large number of entries for these championships shows that this particular sport is becoming increasingly popular among all ranks of the R.A.F. and W.R.A.F. Where such enthusiasm exists results quickly follow, and this was clearly demonstrated by the W.R.A.Fs.' decisive victory in the Inter-Services Badminton Cup with their 16 wins to the W.R.A.C.'s 8 and the W.R.N.S.'s 3.

CRICKET

Air Marshal C. R. Steele, C.B., D.F.C., Air Officer Commanding-in-Chief, Coastal Command, has taken over the Chairmanship of the R.A.F. Cricket Association, and Wing Commander B. R. Macnamara, D.S.O., is the new Secretary.

Included in this year's full fixture list for the R.A.F. XI are matches versus

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the Leprechauns, in Belfast, on 1st and 2nd June; Civil Service, at Chiswick, on 19th and 20th June; Glamorgan, at Barry, on 12th and 13th July; and the Free Foresters, at Halton, on 22nd and 23rd July.

The inter-Service matches will be played at Lord's against the Royal Navy on 7th and 8th August, and the Army on 30th and 31st August.

Prior to the selection of the representative team, two trial matches have been arranged, the North at Cranwell on 22nd and 23rd May, and the South at Henlow on 25th and 26th May.

SQUASH RACKETS

Group Captain B. K. Burnett, D.F.C., A.F.C., who won the championship in 1937, was this year's R.A.F. champion, defeating Flight Lieutenant J. Waugh in the final at the Hampstead Squash Rackets Club.

In the W.R.A.F. Championship, Squadron Officer M. M. Sturge defeated last year's champion, Flight Officer N. Fernihough.

No fewer than fifty-four stations entered teams of five players for the Inter-Station Competition.

LAWN TENNIS

Group Captain B. K. Burnett, D.F.C., A.F.C., this year's squash rackets champion, who, in 1939, was the winner of the R.A.F. Lawn Tennis Singles Championship, is the new Chairman of the R.A.F. Lawn Tennis Association, and Wing Commander G. L. Seabrook, the new Secretary.

The R.A.F. and W.R.A.F. Individual Lawn Tennis Championships for 1950 will again be played at the All-England Lawn Tennis Club, Wimbledon, from 24th to 29th July, the Inter-Services Championships being held there on 31st July and 1st August.

The first rounds of the Inter-Station and Inter-Command Competitions for both the R.A.F. and the W.R.A.F. will be starting early in May.

SWIMMING

The new Chairman of the R.A.F. Swimming Association is Air Commodore J. Marson. Squadron Leader W. T. Harrad has taken over the dual duties of Hon. Secretary and Treasurer.

There is a very full fixture list for 1950 for both the swimming and water-polo teams which includes a week's tour of matches with the leading London clubs from 22nd to 30th May. It is during these matches that the selectors review the new talent in the R.A.F. since the close of last season.

This year's R.A.F. and W.R.A.F. Individual and Inter-Command Championships are being held on 29th, 30th and 31st August at R.A.F. Station, St. Athan.

The Inter-Services Championships are again being staged in London, on 21st September. This year the Royal Air Force act as hosts and it is intended to put on the finest swimming show that has ever been held in London.

Criticism, if any, of the R.A.F. representative team would be that in the Inter-Services Championships water polo was the weakest link. In our endeavour to strengthen this and get more players to select from, an Inter-Station Competition has been introduced. All stations affiliated to the Association are eligible to enter one team. The President of the Association, Air Marshal Sir John Whitworth Jones, K.C.B., has kindly consented to present a trophy for the winners.

Another trophy which is being competed for this year, for the first time since 1939, is the Mounsey Trophy, the present holders of which are No. 15 (B.) Squadron. The award is made to the R.A.F. station qualifying the greatest

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Royal Air Force representative basketball team, 1949-50
Air/App. Kingsbury, Pilot II Kirk, Flight Lieutenant Radzisewski, Sergeant South, Sergeant Peat, Corporal Hoy, Corporal Air/App. Jordan, A.C. McCall, Air/App. Noyes and L.A.C. Johnson

number of personnel in proportion to its strength for a period from 1st May to 30th September. To qualify, each individual must swim continuously fifty yards breast-stroke, fifty yards back-stroke and fifty yards free style. Certificates are awarded to all who qualify.

TABLE TENNIS

In its first year the R.A.F. Table Tennis Association is going ahead in leaps and bounds. Representative matches against some of the best clubs in the country have been played and the Association has come out about square, which one must agree is a good performance in its initial year.

Individual championships for both men and women will be held in London on 31st March. The competition is being run in three sections, preliminary games being played in Manchester and London, with the winners in each area playing off at Slough on 31st March.

Singles and doubles events for both R.A.F. and W.R.A.F. will be played, as well as mixed doubles. At the moment over 300 entries have been received for the Men's Singles event, eighty-nine for the Doubles, with thirty-six W.R.A.F. Singles and eight Doubles.

Inter-station and inter-command competitions for both R.A.F. and W.R.A.F. personnel have been running during the season, and are now coming to the final stages. In the R.A.F. Inter-Station Competition seventy-three stations entered, the composition of a station team being four singles players and one doubles. R.A.F. Stations, Oakington, Binbrook, Weeton, Stafford, Manston, Middle Wallop and St. Athan, and Headquarters Unit, Bomber Command, are the last eight teams.

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CONCERNING PERSONNEL

ROYAL AIR FORCE APPOINTMENTS

[Air Ministry Photo

Air Chief Marshal Sir Ralph A. Cochrane, K.C.B., K.B.E., A.F.C.

Among the appointments announced by the Air Ministry since the issue of the January number of this journal were the following:

AIR MINISTRY

Air Chief Marshal Sir Ralph A. Cochrane, K.C.B., K.B.E., A.F.C., as Vice-Chief of the Air Staff.

Air Marshal Sir Arthur P. M. Sanders, K.B.E., C.B., as Deputy Chief of the Air Staff.

Air Vice-Marshal N. C. Ogilvie-Forbes, O.B.E., as Assistant Chief of the Air Staff (Intelligence).

Air Commodore H. V. Satterley, C.B., C.B.E., D.F.C., as Director of Operational Requirements.

Air Commodore G. Scarrott as Director of Equipment (B).

Air Commodore J. McC. Kilpatrick as Deputy Director-General of the R.A.F. Medical Services.

Group Captain B. C. Yarde, C.B.E., as D.D.P.S. (3).

Group Officer N. Dinnie as Deputy Director, W.R.A.F.

HOME COMMANDS

FLYING TRAINING COMMAND

Air Marshal Sir Hugh S. P. Walmsley, K.C.I.E., C.B., C.B.E., M.C., D.F.C., as Air Officer Commanding-in-Chief.

FIGHTER COMMAND

Air Vice-Marshal D. F. W. Atcherley, C.B.E., D.S.O., D.F.C., as Senior Air Staff Officer, Headquarters, Fighter Command.

Air Vice-Marshal T. G. Pike, C.B., C.B.E., D.F.C., as Air Officer Commanding No. 11 Group.

TECHNICAL TRAINING COMMAND

Air Vice-Marshal W. E. Barnes, M.R.C.S., L.R.C.P., as Principal Medical Officer, Headquarters, Technical Training Command.

Group Officer J. L. A. Conan Doyle, O.B.E., as W.R.A.F. Staff Officer, Headquarters, Technical Training Command.

MAINTENANCE COMMAND

Air Commodore C. J. Nobbs as Senior Air Staff Officer, No. 41 Group.

COASTAL COMMAND

Air Vice-Marshal G. R. C. Spencer, C.B.E., as Air Officer Commanding No. 19 Group.

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Transport Command

Air Marshal Sir Aubrey B. Ellwood, K.C.B., D.S.C., as Air Officer Commanding-in-Chief.

Air Vice-Marshal E. K. Kingston-McCloughry, C.B., C.B.E., D.S.O., D.F.C., as Air Officer Commanding No. 38 Group.

Imperial Defence College

Air Vice-Marshal W. L. Dawson, C.B., C.B.E., D.S.O., as Royal Air Force Instructor.

R.A.F. Staff College

Air Commodore L. F. Sinclair, G.C., C.B., C.B.E., D.S.O., as Assistant Commandant at Bracknell.

School of Land/Air Warfare

Air Vice-Marshal L. F. Pendred, C.B., M.B.E., D.F.C., as Commandant (at Old Sarum, Wilts).

Aeroplane and Armament Experimental Establishment

Air Commodore A. W. B. McDonald, C.B., A.F.C., as Officer Commanding.

[Air Ministry Photo

Air Vice-Marshal Sir Harry Broadhurst, K.B.E., C.B., D.S.O., D.F.C., A.F.C., who has recently been appointed as Senior Air Staff Officer, British Air Forces of Occupation, Germany, is seen in happy mood in the picture above. This picture was taken during the visit to an advanced airfield in Normandy by Marshal of the Royal Air Force Lord Trenchard, G.C.B., G.C.V.O., D.S.O., D.C.L., LL.D., who is seen talking to the new S.A.S.O. In the background are (on the left) *Group Captain P. G. Jameson, D.S.O., D.F.C., of the R.N.Z.A.F., and* (on the right) *Wing Commander Robin Johnston, D.S.O., D.F.C. Of Sir Harry Broadhurst's generation not many wear today as distinguished a top row of ribbons, but the early date of this picture fails to depict these. His outstanding career in Fighter Command, in the Desert Air Force and in the 2nd Tactical Air Force is well known throughout the Services*

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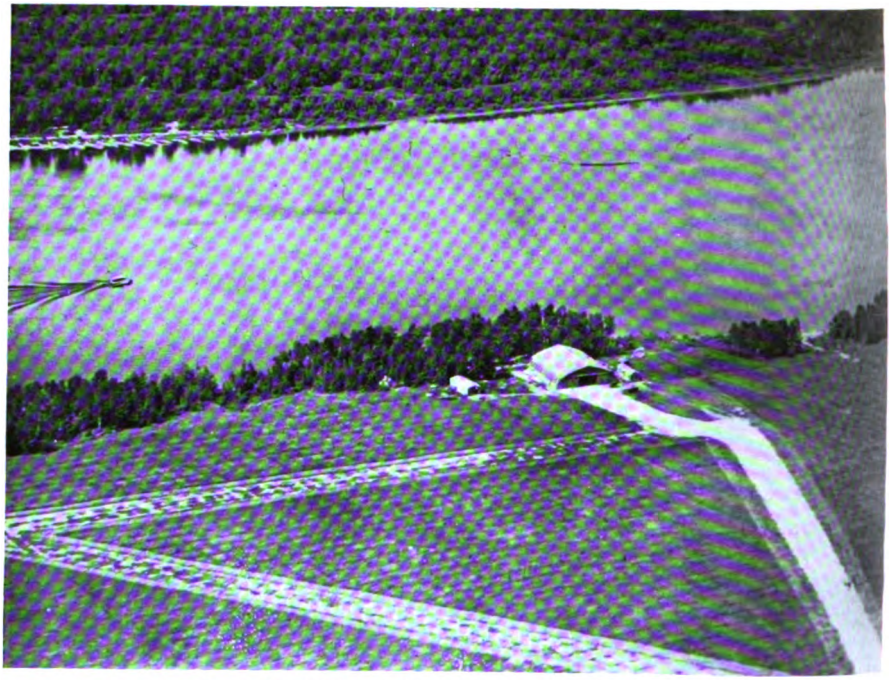
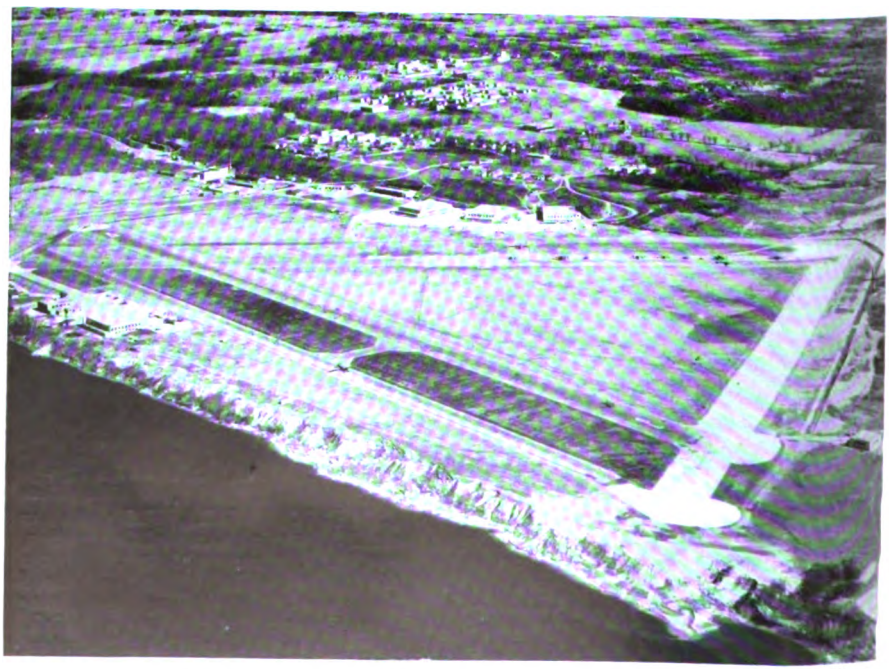


Rockcliffe (Ottawa) Air Station in the early twenties



[R.C.A.F. Photos

Aerial picture of R.C.A.F. Station at Rockcliffe, taken in 1949

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OUR COMMONWEALTH AIR FORCES

ROYAL CANADIAN AIR FORCE

ROCKCLIFFE (OTTAWA) AIR STATION, 1920—1950

SPRAWLED out along the banks of the Ottawa River, within sight of the nation's Parliament buildings, Rockcliffe air station was born shortly after the First World War, and has grown with the R.C.A.F. As our illustrations show, there have been some big changes in the buildings, runways and size of this air station; new aircraft have come and gone; fledgeling pilots who flew from this airfield in those early days have become Air Members, but the type of work done there has remained unchanged. Today, as in the early 20's, activity at Rockcliffe centres round three things—photography, transport, and experimentation.

These three jobs have been closely woven into Rockcliffe's history, from the day in 1920 when the first aircraft took off from the "vacant land behind the rifle butts," as this early R.C.A.F. station was described. But while the work carried out there is basically unchanged, the station would hardly be recognizable to a visitor returning after twenty-five years' absence. Much has taken place in that quarter of a century. Gone is the single portable "Bessoneau" hangar which graced the field in its early days. Gone, too, are the flimsy aircraft of the period which took off from the river or the field, and gone, too, are the rifle butts, which must have posed an extra operational hazard to operating aircraft.

Today Rockcliffe is synonymous with the R.C.A.F.'s far-flung transport operations, for here is the headquarters of the Air Transport Command. To mention Rockcliffe in any part of Canada brings to the mind of all Canadians aerial photography, for the extensive photographic survey operations, which now attract world-wide interest, are controlled from Rockcliffe, coming directly under No. 22 Photographic Wing, responsible in turn to Air Transport Command. And here, too, is the R.C.A.F.'s Experimental and Proving Establishment, where highly important work is done in testing and developing new equipment.

The station is now one of the show places of the Service. The large, green, flying field, with its criss-crossed, hard-surfaced runways, borders the river on one side, and on the other side lie the hangars and works buildings. Behind them rises a steep bluff, and on top, overlooking the field, are the station messes, quarters and administrative buildings. The view from the upper level is perhaps the finest on any R.C.A.F. station. Stretched out below is the flying field, with gleaming silver- or white-painted Lancasters, Dakotas or Cansoes drawn up on

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the tarmac. Beyond the field is the Ottawa River, while farther distant yet rise the gentle Gatineau Hills. It is indeed an artist's picture.

The senior officer is Air Commodore A. D. Ross, G.C., C.B.E., Air Officer Commanding Air Transport Command. A genial 42-year-old pilot who entered the R.C.A.F. in 1928 from the Royal Military College, Air Commodore Ross has a big job. Under his control are the three straight transport squadrons, No. 412 at Rockcliffe, No. 426 at Dorval and No. 435 at Edmonton. He is responsible also for No. 22 Photographic Wing, under which come the now internationally famous photographic survey operations, and No. 1 Photographic Establishment, which plays a vital ground role in the operations. Also coming under his control are the School of Photography, No. 901 Air Traffic Handling Unit, the R.C.A.F. detachment at Arnprior, where flying is done for the National Research Council, and, just for good measure, the Central Accounting Records Office.

He has intimate personal knowledge of the job, for before the war he was one of the Air Force's outstanding "bush pilots," logging many hours on photographic work and other operations over the North Country.

During the last war he commanded a base in No. 6 Group, and it was here that he exchanged his right arm for the blue ribbon of the George Cross that can be seen on his tunic. An aircraft returning from bombing operations one night crash-landed into another bomber parked in a dispersal area, fully loaded. Aided by two airmen, and with complete disregard for exploding 500-lb. bombs, Air Commodore Ross managed to rescue the pilot and rear gunner, but in so doing he lost his right arm below the elbow.

Working closely with Air Commodore Ross are Group Captain R. F. Gibb, A.F.C., his Chief Staff Officer, and Wing Commander W. H. Swetman, D.S.O., D.F.C., his Senior Air Staff Officer. Group Captain Gibb, like his A.O.C., is a former Service "bush pilot," being one of the first N.C.O. pilots in the R.C.A.F. At 42 years of age he can look back over twenty-four years' service, having joined when 17. He is a quiet man, not given to excess wordage, but what he does say is to the point. "He may be quiet, but he sure knows his job," is the way one of his brother-officers described him. Few officers know the men serving under them as well as does Group Captain Gibb, and this interest has resulted in his becoming extremely popular with all ranks.

Wing Commander Swetman, known universally as "Bill," is a 29-year-old war-time bomber ace who has a cheerful way of making light of any difficulties that happen to crop up. "Don't worry over troubles; figure how to overcome 'em," is his way of going about things, and he manages to impart a lot of his cheerful, enthusiastic efficiency to those working under him.

Lack of space alone prevents adding to these brief pen-pictures of personalities at Rockcliffe. The leadership and sound spirit engendered by such men have perhaps a good deal to do with the splendid record of achievement of Air Transport Command, Rockcliffe.

R.C.A.F.'s PHOTOGRAPHIC SURVEY WORK

The work of covering Canada by aerial photography began from Rockcliffe in 1921, and that year 280 square miles were covered. The work was gradually stepped up as improved aircraft and equipment were brought into use, and the 1948 operations saw an all-time record achieved, the photographic planes returning to their home base after having covered 911,000 square miles. This more than doubled the previous record, set in 1947, at somewhat more than 400,000 square miles. Operations during 1949 rolled up a total of 859,000 square miles, bad

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weather preventing a new over-all record from being set. The photographic planes did, however, establish one record in 1949, setting a new high for amount of vertical photography done.

Aerial photography done by the R.C.A.F. is of two types: vertical and tri-camera. Vertical photography is used for detailed mapping and analysis, while tri-camera photography, a faster and less expensive method, provides a basis for production of small-scale maps and aerial charts, in which detail is not required.

Actual photography is done by big Canadian-built Lancasters and by Dakotas, while Canso amphibians and Norseman seaplanes are used for flying in supplies and personnel. Three squadrons—Nos. 408, 413 and 414—operate on the work, Nos. 408 and 414 doing the majority of the actual photographic operations, with No. 413 specializing in transport of personnel and supplies to remote bases used during the summer activity.

Aircraft of the squadrons operate through the summer in detachments, each detachment being made up of one or more aircraft, and being responsible for covering certain areas. In some cases operations can be carried out from established bases, where normal living conditions and maintenance facilities exist. In some cases, however, detachments operate for the season from isolated temporary bases, living and carrying out maintenance under primitive conditions. In such cases the detachment must operate as a complete unit on its own, carrying its own ground crew, including mechanics, wireless operators and cooks. Crews are often thrown on their own resources when emergencies or special problems arise, and ably carry on the traditions of the northern bush flyers.

The first aircraft normally leave Rockcliffe some time in April, as soon as weather conditions permit, and the season generally ends in about the middle of October. The photographic operations provide a constant battle between the aircraft and their crews and the weather, for areas to be photographed in most cases must be free from ice and snow. The retreating winter season is followed closely northward, and the work is done on the heels of the melting snow and ice. In some areas, however, convection cloud forms as the land warms, and it is not unusual in certain regions to find only a few days during the entire season suitable for operations. To obtain coverage of these regions the R.C.A.F. must be on the spot, ready to fly fifteen to twenty hours a day, while conditions remain good, a feat made possible by near round-the-clock daylight conditions during the summer months.

The R.C.A.F. is presently working on shoran-controlled survey, a method of establishing necessary ground position points for fixing aerial photographs into the map by means of radar, in place of flying-in ground parties to take astronomical fixes. In the past, ground surveyors from the Department of Mines and Resources have been flown in to unsurveyed areas to establish accurate ground positions for this purpose. Use of ground radar beacons, together with airborne radar equipment, enables aerial photographs to be positioned without this ground work. A network of such radar beacon sites for this purpose has been set up in Manitoba and Saskatchewan and is being used by the R.C.A.F., and it is expected that the network will be extended to other parts of the country. Future operations will determine to what extent this method may displace actual ground survey work.

While No. 22 Photographic Wing's aircraft are spread from coast to coast, and from the southern border to the Arctic islands throughout the photographic season, the nerve centre for the work remains the operations room at Rockcliffe, where the areas being covered are carefully plotted. From the "ops" room flash

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The R.C.A.F. increased its operations in the Far North during 1949, and flying conditions there often present hazards calling for extra skill and caution, as can be seen from the floating ice in the above picture. The aircraft is a No. 413 Photographic Survey Squadron Canso and the scene is Amundsen Gulf, in the Western Arctic, in mid-summer

[R.C.A.F. Photos

Photographs taken by the R.C.A.F. Aerial Photography Squadrons are rushed to Rockcliffe aerodrome, near Ottawa, where they are laid out in a mosaic to determine whether any gaps have been left in the area covered

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out wireless signals shifting detachments from one location to another, as work is finished at the various points, or as changing weather conditions reveal opportunities to get a difficult spot covered before conditions alter.

Film exposed in the field by the photographic planes is rushed back to Rockcliffe, where No. 1 Photographic Establishment takes over. Possessing one of the world's finest and most modern aerial photographic laboratories, the establishment is renowned throughout the photographic world, and attracts many visitors from foreign lands. It plays a vital part in the over-all photographic survey programme. The exposed film arrives at Rockcliffe in 450-foot rolls, accompanied by a full report listing the area covered, weather conditions at the time the film was taken, height and speed of aircraft, and other details. The film is put through continuous processing machines for development, and is turned out at the rate of five feet a minute. The negatives then go to the annotating tables, the tops of which are glass, with strong lights underneath. Here the film is given an initial check by skilled airmen and N.C.Os. for accuracy and quality, and each negative is marked with a number, to allow instant identification. Possible gaps in the area being covered, and caused by camera failures or lack of forward overlap, are spotted at this stage. Highly skilled personnel are required to ascertain quickly the cause of certain failures, and the ability of the establishment men to analyse camera faults instantly from the negatives results in large savings in time to the operational units in the field. The negatives are printed and laid out to form a rough mosaic, and the mosaic is photographed by an overhead travelling camera. This shows whether any lateral gaps exist between the strips of photographs, resulting from errors in navigation on the part of the photographic aircraft. If so, the detachment concerned is immediately notified, in order that it may correct the fault.

The R.C.A.F.'s aerial photography programme fits into a closely co-ordinated pattern which involves the R.C.A.F., the Army, Mines and Resources, and other Government departments. In addition to their military value, the photographs are used in countless other ways, from water power development and mineral exploration to town planning schemes. Agricultural experts are able to obtain much valuable information from them, and the cordage of forest areas can be accurately estimated. The photographs themselves are taken in strips, each individual picture overlapping the one next to it, allowing them to be viewed in pairs through a stereoscope. By this means, used widely during the war to bring out hidden enemy positions, an unbelievable amount of detail is revealed.

Although responsible for most of the aerial photography done in Canada for official purposes, No. 22 Photographic Wing does not handle the task of turning the photographs into maps. The finished prints are turned over to the Army and to Mines and Resources, who make the actual maps. Those prints having commercial value may be purchased by mining companies, lumbering concerns, and other such agencies.

Much of the work is done in the north, but the R.C.A.F. does not restrict its photographic operations to that region. It is in the Far North, however, that the aerial photographs reveal startling inaccuracies in existing maps. In 1934, for instance, it was discovered from such photographs that Akimiski Island in James Bay was practically upside down on all maps. In another case a hamlet was found to be several miles from its proper location, and in 1947 a photographic aircraft rediscovered the "lost" Spicer Islands in Foxe Basin, to the north of Hudson Bay. An outstanding example came in 1948, when a photographic survey crew flying one of the big four-engine Lancasters discovered two uncharted islands in Foxe Basin, having a total area of more than 5,500 square miles.

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Although the 1950 photographic survey operations do not begin until April, from a "news release" just received, this year has already produced its first exciting discovery. Crew members of an R.C.A.F. Lancaster flying on an ice reconnaissance over Hudson Bay have reported sighting an apparently abandoned steamship. Estimated at approximately 10,000 tons, the ship was fast in the ice off Mansell Island, near the entrance to Hudson Bay.

The Lancaster circled over the ship in an endeavour to observe possible signs of life, but could see none. Although the vessel's deck was sheathed in ice, its general appearance gave the impression that it had not been abandoned for any length of time.

Aerial photographs of the ship have been submitted with the report to the Department of Transport, but there appears to be no record of any vessel of such size having been abandoned in this area. What a story this would make for a novelist!

The officers and men of the three photographic squadrons, at the time this article was being written, were hectically busy getting ready for another season in the field. By the time that THE ROYAL AIR FORCE QUARTERLY is issued early in April the first aircraft will be taking off from Rockcliffe, circling the towers of Ottawa's Parliament Buildings just three miles distant, and setting off for another season's flying that will take them from the southern border to the islands in the Far Arctic.

By the time they return to their home base it will be autumn. More discoveries will have been made and their crews will have seen a lot of Canada, much more than most Canadians see in a lifetime. They will also have contributed a good deal towards the military defence of their country, and the general economic and industrial development of Canada. For the aerial photographs they will have taken during the season provide maps of vital military importance, and are used in countless ways commercially.

It may be—as has happened before—that when the photographic planes return they will have found new islands, larger than English counties, the existence of which was previously unknown. They may return with photographs and reconnaissance sketches showing existing maps of certain northern regions to be badly inaccurate. In any case, it is certain that when they touch down at Rockcliffe they will have completed another phase in the largest peace-time operation of the R.C.A.F., one which is proving of inestimable value to Canada.

Yes, sir, it's a grand job of work!

[Acknowledgment is made to the Chief Information Officer and to the R.C.A.F.'s own journal, *The Roundel*, for kindly supplying the illustrations and material for the above article.]

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SOUTH AFRICAN AIR FORCE

AN OUTLINE OF ITS HISTORY

By Major P. E. Stableford, S.A.A.F.

(*Continued from page 89, January, 1950, issue*)

THE POST-WAR ERA

THE post-war South African Air Force came into existence in May, 1946, by which time demobilization was complete. The S.A.A.F. as now constituted consists of a composite force of fifteen squadrons, which includes one fighter wing, one medium bomber wing, one coastal reconnaissance wing, a transport squadron, and a motor-boat squadron. The manning of this force, which requires 10,000 men, is to be undertaken on a basis of one-third Permanent Force and two-thirds Active Citizen Force. In addition to the operational units there is a Central Flying School, a Bombing, Gunnery and Air Navigation School, a School of Technical Training, a Photographic School and a Wireless School, two air repair depots, two air stores depots, and one reserve aircraft storage depot. The S.A.A.F. mans nine air stations, of which six are airfields and one a flying-boat base. These stations are spread throughout the country.

MANNING PROBLEMS

In common with all other air forces, the S.A.A.F. suffered from post-war man-power problems. These were caused by numerous factors, not the least of which was the considerable industrial development that was taking place in this country when the war concluded. This development has now slowed down, and industry is no longer offering attractive terms to skilled technicians, with the result that the drain on our trained man power has almost ceased. Although we are almost up to full strength the general manning position is still unsatisfactory, as so much of our strength is comprised of trainees. In the long run, however, this "new blood" will be to our advantage, as a force comprised of too many "old hands" is not as flexible as one would desire.

OPERATIONAL COMMITMENTS

The S.A.A.F. has a number of operational commitments, which include pest control by aerial spraying (using Ansons), photographic survey with Dakotas, air transport operations locally and overseas, including the Berlin air-lift, meteorological ascents, air rescue in Southern Africa, and aid to the civil power. This last involved the S.A.A.F. in a brief but intensive period of operations

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during the Durban riots, when several hundred police reinforcements were flown to the affected area. In addition, operational training is carried out in the Fighter Wing using Spitfire IX's; these are to be replaced within the next month by Vampire V's. The Medium Bomber Wing is training on Venturas (B34), and the Coastal Wing is carrying out naval co-operation and G.R. training on Sunderland V's and Venturas (PV1). A tactical reconnaissance squadron, at present using Austers, carries out co-operation exercises with the land forces.

FLYING TRAINING

The main flying training activity is centred around the Union Air Training Group, a joint civil-military organization charged with the responsibility of training pupil pilots for the Active Citizen Force element of the squadrons. The initial training of these pupils is carried out on Tiger Moths at selected civil flying clubs, and after about eighty hours the pupils spend a thirty-day period of continuous training at the Central Flying School, where they are converted to Harvards. They then return to their civil clubs, where they continue their training on Harvards before coming back to the Central Flying School for final training and wings tests. The whole course takes sixteen months, during which time the pupils fly about 220 hours. On completion of their course they are commissioned, given their wings and posted to their A.C.F. squadrons, where their Service flying training takes place. This scheme is producing about sixty pilots per year.

There are a number of Permanent Force cadets under training at the South African Military College, but they have not as yet reached the stage where they are to undergo flying training. This will be done in due course at the Central Flying School. The latter unit is meanwhile engaged on conversion training, refresher flying and instructors' courses.

OTHER TRAINING

The accent is on technical training in other spheres, where about 800 apprentices are undergoing their basic and trade training at the School of Technical Training. On completion of the first eighteen months, apprentices spend a period of three years in depots and squadrons before returning to the School of Technical Training for the final six months' course before qualifying. Other non-flying training includes administrative training at the Air Force Wing, S.A. Military College, photographic training and wireless operator and radio and radar maintenance training at the Wireless School.

THE ACTIVE CITIZEN FORCE

A considerable effort is being put into the organization of the Active Citizen Force, as it is realized that therein lies our strength in the event of an emergency. To date seven A.C.F. elements of squadrons have been formed, and at present are manned by ex-war-time aircrew. The ground staffs are being provided by civil apprentices called up under the Defence Act. They are serving their apprenticeships in some suitable trade, but if they are in some potential war industry, such as the South African Iron and Steel Corporation or South African Railways and Harbours, they are not accepted. The scheme is still in the experimental stage, but it has definite possibilities and is being expanded.

Other aircrew musterings, i.e., navigators and wireless operators, etc., are trained in the squadrons. The pilots are produced under the scheme mentioned above.

The aim of all A.C.F. training is to produce skilled reservists in sufficient numbers to meet our expanded war-time requirements, and an S.A.A.F. Reserve

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is being formed to provide the necessary categorized and trained man power to fill our war establishments. Mobilization plans are under examination.

ORGANIZATION

All the units and activities referred to above are under the control of the Air Directorate, which is virtually a composite group headquarters. It is organized on the standard three-pronged basis and is responsible for all operational and policy control throughout the S.A.A.F. The Air Directorate is headed by Brigadier J. T. Durrant, C.B., D.F.C., as Director-General of Air Force.

NEWS FROM SOUTH AFRICA

Messrs. G. A. de Bruyn and M. H. Pansegrouw have been appointed Public Relations Officer and Assistant Public Relations Officer respectively to the Department of Defence and Editors of the U.D.F. magazine, *Commando*. Their duties are: (*a*) to be the liaison between the three Forces and the State Information Office; (*b*) to popularize the Permanent Force for the youth of the country and to investigate all sources for recruiting purposes; (*c*) to make plans for the use of effective advertisement and other forms of propaganda, e.g., the Press, radio, talks and films, and to carry them out; (*d*) to visit schools, colleges and universities and to give talks there; (*e*) to handle all Press inquiries in connection with the fighting Forces; (*f*) to undertake the editing of the U.D.F. magazine, *Commando*.

* * * *

Lieutenant-General Len Beyers, Chief of the General Staff, Union Defence Forces, has resigned his post.

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BOOK REVIEWS

Rommel. By Desmond Young. 288 pp. Illustrated. (Collins; 12s. 6d. net.)

We British are so renowned for our habit of glorifying the achievements of our enemies and decrying the equally fine efforts of our own people that Brigadier Young might well have been accused of merely following precedent in this biography of Rommel. It is a tribute to the quality of his book and of Rommel himself that no critic has even hinted at this possibility.

It is nevertheless an almost incredible story, for, next to Hitler, Rommel was the most popular man in Germany, although not a Nazi. He was trusted by the *hochwohlgeboren* Prussian officer class, although born the son of a Wurttemberg schoolmaster. The rank and file of his armies idolized him because he was "one of themselves," although he often drove them almost beyond endurance. He was even respected by his enemies, because he always fought according to the rules, though showing no mercy and expecting none. To complete the paradox, the hard, brilliant, military tactician was also a simple, homely and devoted husband and father.

With such a subject it is hardly surprising that Brigadier Young has produced a "best seller." What begins as a straightforward account of Rommel's youth and of his career as a dashing young subaltern in the First World War ends in Roman tragedy, with a touch of modern Chicago, for Rommel was "taken for a ride" on the orders of his chief. The end of the story is, in fact, almost too fantastic even for Chicago; it could only have been written in the crazed, crumbling fabric of 1944 Nazi Germany.

Three-quarters of this book are devoted to Rommel's exploits in two world wars and between wars. Descriptions of his many narrow escapes from death or capture show that "we were a little unlucky to be bothered with (him) in Africa," though the author remarks how much better it was to be opposed by such officers as Rommel, von Ravenstein and Bayerlein rather than by the S.S., who were even outside the disciplinary powers of their commanding general, being answerable only to Himmler.

It was Rommel's loathing for the methods of the S.S. in Europe, his horror on learning of Nazi concentration camps, and his final realization that Hitler intended to destroy Germany if he could not win the war that led him to his "pitiless destiny," described in the last quarter of the book.

After his return from Africa, he became increasingly certain that Germany would be destroyed unless she sued for peace. In particular, he feared the effects of overwhelming Allied air power, for he believed that "Anyone who has to fight, even with the most modern weapons, against an enemy with complete air superiority, fights like a savage against modern European troops, under the same operational and tactical handicaps and with the same chances of success."

Consequently, when he was approached by a group of prominent Germans, including Dr. Goerdeler, Mayor of Leipzig, and Colonel-General Beck, former Chief of the General Staff, who planned to end the war, he agreed to become their leader, not knowing that the plan hinged around a bomb attack on Hitler's life or that he was to be made President of the Reich after Hitler's death.

On D Day he kept faith professionally with his Fuehrer, fighting with every ounce of his skill, personal bravery and strength against the Allied invasion forces, although he knew that it was a lost cause. Six weeks later his other cause was lost when the *coup* against Hitler failed.

The story of the tragic months which followed, of how the ramblings of a dying officer focused suspicion on Rommel, and of how the ring of the Gestapo slowly closed round his quiet home at Herrlingen, are as exciting as any novel and infinitely more moving. But Rommel will best be remembered for his tactical brilliance in battle and not as a broken figure dying of poison in the back of a Gestapo car.

There is an old German saying that "the next-best thing to a good friend is a good enemy." Brigadier Young leaves us in no doubt that Erwin Rommel was a good enemy.

I. W. R. T.

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The Army Air Forces in World War II. Edited by W. F. Craven and J. L. Gate. (University of Chicago Press, 1949.)

The second volume of the history of the United States Air Force, as the Army Air Forces are now called, makes a welcome addition to the historiography of the Second World War. As the sub-title of the volume (*Europe: "Torch" to "Pointblank" [August, 1942—December, 1943]*) would suggest, this second volume deals with the American air operations in the Mediterranean and the Continental bomber offensive against Germany. The organization of the volume reflects, in its first four sections, the geographical division between the European and Mediterranean areas. Sections I and III deal with the Mediterranean, the first ending at the natural division, in May, 1943, with the German defeat and capitulation at Cap Bon. Section III tells the story of the capture of Sicily and the invasion of Italy, and ends with the Allies temporarily stopped in their drive up the Italian peninsula. Sections II and IV are concerned with the Army Air Forces' campaign of strategic bombing of Germany and occupied Europe, the break between those two sections coming, at a time near the Axis surrender in Tunisia, with the adoption of the Combined Bombing Offensive Plan. The volume then attempts to continue the parallel stories of two campaigns, widely separated in space, but by the end of 1943 the distance between the active air fronts had been materially lessened and the essential unity of the two theatres from the air point of view—a favourite doctrine of the U.S.A.A.F.—had become more obvious. In Section V, the last section of the book, the authors have attempted to bring together the significant changes in organization in both theatres.

The second volume sets out to be a history of the American Air Forces, and in this it succeeds admirably. Yet, in segregating the efforts of their own forces from the operations of the various R.A.F. commands, the contributors have, at times, failed to render the air operations intelligible. Air operations, or descriptions of them, cannot be parcelled out and separated into raids or sorties by one country's forces or another. One complete picture has to be presented. For convenience of writing and ease of understanding they may be divided analytically, but to present only one side of the picture is misleading. This is especially true of the story of "Torch" and the chapter dealing with the American Ninth Air Force in the Middle East. Happily this defect is remedied in the story of the Sicilian expedition, and in the story of the Eighth Air Force, where the help it received and the experience it drew upon from the R.A.F. are amply acknowledged.

It comes strange to British eyes that so little is made of the landings near Casablanca on the French Moroccan coast. It was at Medhia-Port Lyautey that the greatest French resistance was encountered. Admittedly the main consideration is the story of the American Army Air Forces, but surely mention of the work of the U.S. Naval Air Service could have been made. A similar omission occurs about the Oran landings. The British carrier force and the work it did are scarcely mentioned, although the Twelfth Air Force, which did comparatively little work on D Day, are written large. The volume notes the Algiers landing in passing and then goes on to the British assaults of Bougie and Djidjelli. The forward movement of the British fighters and their support of the Army operations in the early stages are not mentioned. In this early period it was the R.A.F. Eastern Air Command that bore the brunt of the fighting. Later the reorganization of the air forces is described rather scantily.

It is in this connection that the author has gone rather badly astray. He does not appear to appreciate fully the implications of the establishment of the Mediterranean Air Command. To write "The suggestion that Tedder became Eisenhower's Air Commander was made on 3rd December, evidently as part of a protest against the appointment of Spaatz on that day to the relatively modest position of 'Acting Deputy C.-in-C. for Air Allied Force' " is not supported by the facts. This suggestion had been made previously by the Allied C.-in-C. himself to the Air Officer Commanding-in-Chief, Middle East. Furthermore, the need for the reorganization of the Allied Air Forces and their co-ordination by one Air Commander in the Mediterranean led to the complete reconstruction of the pattern of Allied Higher Command in the field which was to prove so successful in the later operations of the Second World War.

One of the defects of a volume, the work of more than one author, is the change of style and command of language that are found in it. The authors frankly admit this drawback. They also acknowledge a most serious fault. No attempt has been made to reconcile the claims of the number of Axis aircraft destroyed by the Army Air Forces with the figures for German losses of aircraft. However, the editors have promised that the problem of reconciling claims with losses will be investigated and discussed in a later volume.

Parts of this volume will undoubtedly appeal more to one reader than another. To many the tale of the combined bomber offensive, where full acknowledgment is made to R.A.F.

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Bomber Command for the help given to the Eighth Air Force in its early days in Europe, would undoubtedly prove of great interest, while to others the descriptions of the North African and Italian campaigns may hold particular significance. To the reviewer the story of Sicily was more impressive than the rest of the volume. Dispassionate, balanced and written with a full understanding and deep knowledge of the air operations leading to the fall of Sicily, it might well serve as a model for future descriptions of the work of the Allied air forces. On the whole, the authors are to be congratulated on a work generally so free from mistakes. Minor blemishes occur, such as occasional misspellings, but these do not detract from a solid work which will long remain as the standard authority on the U.S.A.A.F. participation in the Second World War.

Global Mission.* By General of the Air Force H. H. Arnold. (Harper & Brothers, New York.)

This is an important book for the student of air power. The career of any man who has reached the highest rank in his Service is bound to be interesting; and doubly so in General Arnold's case. From the time the brothers Orville and Wilbur Wright taught him to fly, apart from a very brief spell, he has been inseparably linked with the growth of American air power. The book, however, contains more than a record of his career, with a commentary on the development of American military aviation. In it he sets forth, indeed underlines, what he considers to be the fundamental doctrines of the uses of air power, and shows how his concepts and beliefs were put into effect, and with what results.

The earlier chapters may not mean very much to British readers. They are, however, interesting historically, as they show from what lowly beginnings grew the largest air force the world has seen. We learn of the chaotic conditions which presented themselves on America's entry into the war. He regrets the fact that no American-designed and built aircraft fought in the First World War, but not that the U.S. Air Force did not become separate and independent as did the R.A.F. towards the end of that war. He gives us a brilliant and penetrating portrait of that almost legendary figure in American Air Force annals General "Billy" Mitchell, whose famous controversy with the U.S. Navy on whether aircraft could sink capital ships aroused so much publicity at the time.

No doubt the most vital part of the book for students is when General Arnold's story is approachnig the beginning of the Second World War. Although America's leaders, political and military, were a year to eighteen months in advance of the American public in their conviction that America must enter the war eventually, it was not until the Japanese attack on Pearl Harbour that the American nation awoke to its peril and loudly clamoured for war. The difficulties which faced General Arnold and his colleagues stemmed largely from the apathy with which the American public had viewed the creation by the Axis of larged armed forces, and the natural reluctance of democracies in time of peace to vote money even for the maintenance of their own Services.

Not all of the difficulties facing the Army Air Forces came as a result of the parsimony of the Government. The United States Navy opposed the development of the long-range bomber, which General Arnold considered essential to the Army Air Force. Not only had he to combat this objection but he had to rationalize the requests of the various warring nations for American aircraft. Not only Great Britain but France, Holland, China and, later, the U.S.S.R. made claims on the aircraft production of the United States. In fact, matters reached such a pitch that he realized that if he were to try to grant all the demands for aircraft he would never be able to build up an American air force. He had reached the position of having a large number of trained aircrew without having operational aircraft for them to fly. This state of affairs could not last. This, among other reasons, occasioned the famous Arnold-Portal-Towers agreement. During a visit to London in May, 1942, he discussed this problem with Air Chief Marshal Sir Charles Portal, Chief of the Air Staff. In the discussions General Arnold pressed the point that "every appropriate American-made aircraft (was) to be manned and fought by our own (i.e., American) crews." This principle the British accepted, provided that the corollary were equally determined, viz., "to bring into action against the enemy at the earliest possible date in the appropriate theatres the greatest strength in fully trained air forces that it was possible to create out of the combined aircraft production, trained man power, and shipping of the United Nations." These formed the basis of an agreement which was signed in Washington by Air Vice-Marshal J. C. Slessor for the Chief of the Air Staff; and the Combined Chiefs of Staff accepted it on 2nd July, 1942.

*It is understood that *Global Mission* will be published in Great Britain.

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Thus fortified, so to speak, General Arnold could proceed to build up his air force. The experience of the early B-17C's in R.A.F. hands had not held out much hope for daylight precision bombing, but the U.S. Army Air Force considered that they had been wrongly used. General Arnold persisted in his theories, and time was to prove that, if not wholly right, he certainly was not wrong. He believed that the main job of the Air Force "is bombardment; large formations of bombardment planes must hit the enemy before he hits us. . . . Daylight operations, including daylight bombing, are essential to success, for it is the only way to get precision bombing. . . ." Who shall say that his beliefs were wrong? At least his Eighth Bomber Command in Europe helped to bring Germany to her knees, and his Twentieth Air Force in the Far East demonstrated against Japan the potentialities of daylight precision bombing.

The sections dealing with the Far East may come as a revelation. In this country the nearness of Germany tended to make the struggle with her all-engrossing. It is interesting to note that, despite the insistence of the American Chiefs of Staff on the doctrine of unity of command and getting it from the Allied forces in Europe, they do not seem to have been so successful when dealing with their own commanders in the Pacific.

General Arnold ends with a caution. The next war will not be a repetition of the Second World War. The development of a post-war air force must go hand in glove with the various technical and scientific developments that may come from time to time. Indeed, an air force must maintain close liaison with any new development likely to be of use in warfare. Even so, his cardinal doctrine of air power remains the strategic bombing of an enemy. Despite his insistence upon his beliefs, the book is far from dull. It is amusingly written, and he seems to be a good raconteur, always capping a point with a good tale. Yet withal the impression remains that he was a man of vision with a determination to see his ideals carried into effect. This book is a "must" for all students of air warfare.

T. M.

British War Economy. By Professor Hancock and Miss Gowing.

Somewhat belatedly (it was published last summer) I have been reading *British War Economy*, by Professor Hancock and Miss Gowing. Hidden behind this possibly unprepossessing title, which may sound somewhat forbidding to the general reader, is a masterly exposition of what total war involves for the man in the street, and the extent to which every aspect of the ordinary life of the community is affected.

This volume is the introductory one to a series of civil histories that will eventually be issued dealing in detail with the many forms of our war effort. There will be, for instance, volumes on war production, the economic blockade, shipping and man power, but these will appeal in the main to the student of each particular subject.

The introductory volume, however, presents in a clear and concise form, against the strategical background of the war, an excellent summary of the means by which the everyday life and activities of the nation were welded into the war machine. This book is, in fact, an essential supplement to such books as *The White House Papers of Harry Hopkins* and Mr. Winston Churchill's war memoirs, if one is to obtain a clear picture of the machinery for the higher direction of the war, and provides in itself almost a complete war history in miniature of the main events.

The method of arrangement in several parts dealing with the main strategical phases, and showing how the economic resources of the country were utilized in accordance with the requirements arising during each phase, makes for a coherent narrative that makes an extremely complicated subject look almost simple. The text is interspersed with a number of statistical tables, which are used to illustrate as necessary the various points that are best dealt with in a statistical form, but these tables in no way detract from the interest of the book. In fact, many of the tables, such as those on man power, are essential to a proper understanding of the text, and bring out more clearly than could be done in any other way the parlous straits to which we were often reduced.

One of the most interesting facts brought out is the amount of pre-war planning that had been done in the economic sphere, arising from a study of the 1914-18 war, and how many of the economic consequences of total war had been foreseen and prepared for to some extent. As long ago as 1929, for instance, the Treasury had produced a memorandum, *The Course of Prices in a Great War*, which forecast with considerable accuracy the financial policy which we were compelled to follow during the war and post-war years, and the drastic controls which would be necessary if disastrous inflation was to be avoided. This memorandum also outlined the financial consequences which would follow the probably unavoidable dissipation of our overseas investments, and is almost a history in advance of our dollar difficulties during the past few years.

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This aspect was summed up by Lord Keynes when he told the American people, during the financial discussions with the United States in 1944, that our "financial imprudence may have been a facet of that single-minded devotion without which the war would have been lost. So we beg leave to think that it was worth while—for us, and also for you." The book brings out very clearly the fact that we had to throw everything we possessed into the balance, in spite of the possible consequences in the future, if we were to emerge victorious.

But, even so, the future was by no means forgotten and it is a remarkable tribute to the vision and foresight of the Prime Minister and the Government to find that as early as 1940 planning for peace-time economic and social reconstruction had started, although it was not until the end of 1943 that Lord Woolton was appointed to the Ministry of Reconstruction, and serious planning began. The schemes then under consideration included not only plans for the conversion of industry from war to peace, housing, demobilization and the absorption of men from the Forces into employment but also plans for the reform of education, a national health service and social insurance, all of which have since been put into effect.

On the lighter side, although it does help to bring home the seriousness of our plight, is the Prime Minister's comment on proposals for extreme austerity measures such as those of a committee of scientists who were called in to advise on the scientific aspects of our food policy in 1940, when it looked as though we might well experience siege conditions through shipping difficulties. The scientists calculated that all our nutritional needs could be provided in theory by a diet of wholemeal bread, oatmeal, fats, milk, potatoes and vegetables. With his usual robust common sense, Mr. Churchill remarked that we were "a modern community at war, and not Hottentots or Esquimaux," and that there were limits below which the standard of living could not be allowed to fall.

The parts of the book which will be of most interest to military students are probably those dealing with man power. This was undoubtedly the most important limiting factor in the build-up and expansion of the Forces, and the shortage of men became increasingly acute as the war progressed. It may not be generally realized that our available man power reached its maximum in the summer of 1943, and that thereafter it progressively declined, as the wastage exceeded the new intake.

And yet this was just the time when the demands of the Services for more men became most pressing. In 1942 it had become clear that by the end of 1943 we would be a million men short of the requirements of the Services and industry. It was no use continuing to expand the Services if this could be done only by withdrawing men from industry, and so reducing the means with which to fight. From then on, therefore, in order to maintain the necessary balance, the Services, far from having their requirements met in full, had their expansion programmes drastically reduced. As a result, it was possible only slightly to increase the total numbers in the Forces between 1943 and the invasion of Europe in 1944, and even this small increase was achieved only at the cost of further sacrifices by the civilian population.

Many officers will no doubt remember the repercussions of the various cuts which had to be imposed on the Services, and, not having access to the relevant information, may have felt at the time that the cuts were unnecessary. But if they read the chapters on man power the conclusion emerges inescapably that there was, in fact, no alternative. When it is realized that in 1944 there were about a million men and women of sixty-five and over in paid employment, it can be seen that the man-power barrel had been pretty thoroughly scraped.

Fortunately our study of the history of the 1914-18 war, and our pre-war planning, had made us fully alive to the necessity for co-ordination between the requirements of the Services for men and materials, and the ability of industry to supply their needs and the minimum needs of the civilian population. We were thus able to avoid the grosser type of mistake, such as that made by the Czarist Government, who, by 1917, had called to the colours 37 per cent. of the male population of working age, although Russia had an industrial population of only five millions out of a total population of 175 millions, thereby condemning the army to fight without adequate supplies, and imposing on the Russian people almost unendurable hardship.

As the war progressed our shortage of man power focused attention more and more on the problems of planning and co-ordination, and as a result our war economy was probably organized on a more efficient basis than that of any other nation. In Germany, as in the 1914-18 war, their shortcomings in the co-ordination of their resources were not least among the reasons why Germany lost both wars, and in the last war the British Government imposed on our civilians much heavier sacrifices than the German Government imposed on German civilians.

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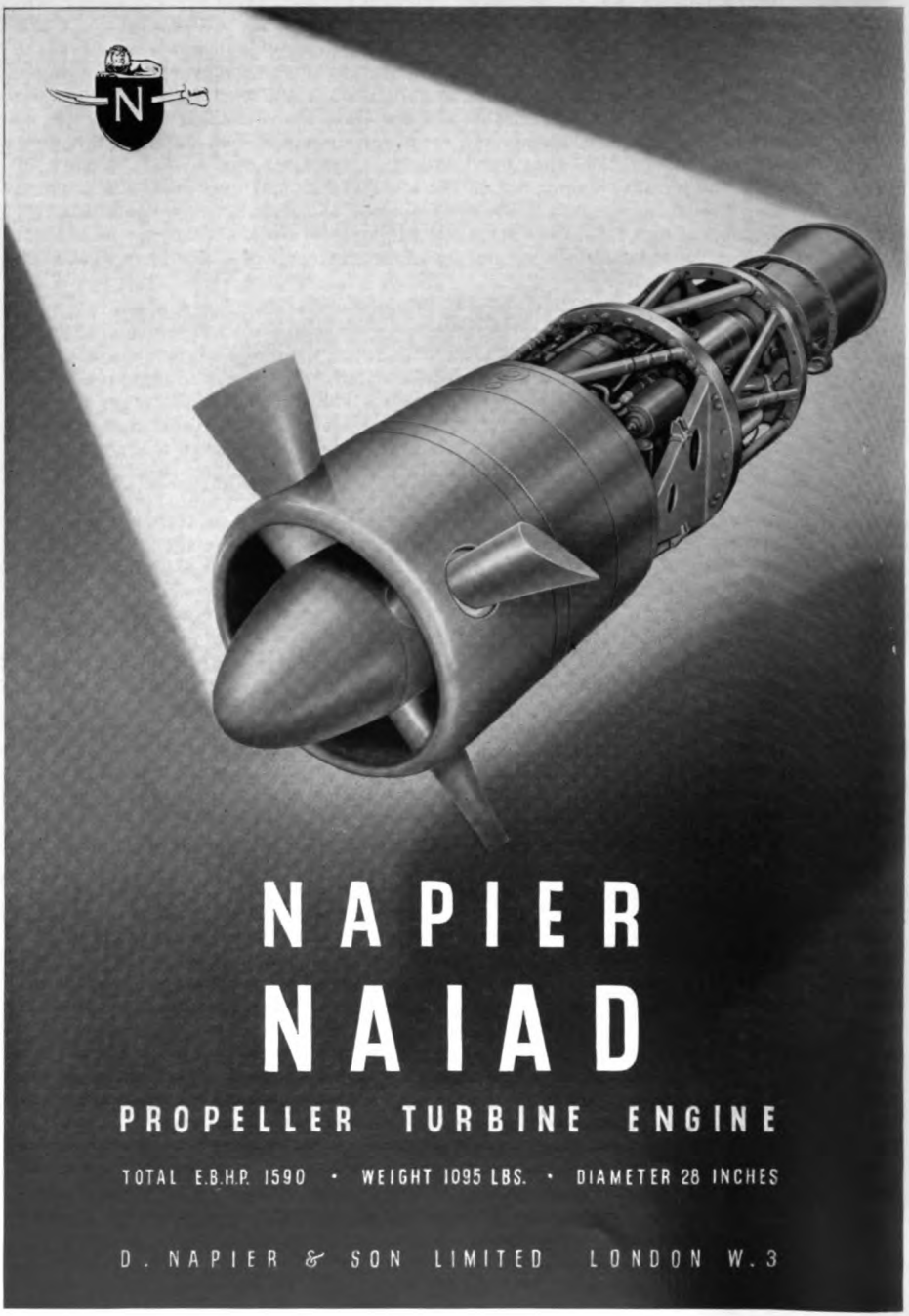
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The theme running through the book is that the purpose of the war economy is to concentrate the available resources to the maximum possible extent upon direct war purposes, and that this necessitates "a division of labour in which the armed forces become increasingly little more than the cutting edge of a ponderous and intricate national machine." Everything else must be subordinated to this, and only the minimum resources devoted to the ordinary needs of the community.

No student of the higher direction of war should neglect this work. It provides an invaluable textbook for the study of an aspect of total war which has hitherto not received the attention it deserves, in view of the interdependence between all major strategical plans and the economic resources of the nation.

W. M. Y.

BOOKS RECOMMENDED

We append a list of books that have been officially "prescribed" (Category "A") and "recommended" (Category "B") for pre-course reading by officers who are going to the Imperial Defence College. These books will also be found useful to serious students of the subjects covered, whether they expect to go to the I.D.C. or not. Most of the books in this list are stocked by the R.A.F. Central Library at Cosford; and they may be borrowed from there by other R.A.F. stations on application to station education officers.

CATEGORY "A"

Imperial Commonwealth. By Lord Elton. (Collins; 21s.)
Democracy and Its Rivals. By Christopher Lloyd. (Longmans; 5s.)
Primer of the Coming World. By Schwarzchild. (Hamish Hamilton; 10s. 6d.)
What is Marxism? By Emile Burns. (Gollancz; 2s.)
Stalin. By Deutscher. (Cumberledge; 25s.)
United States Foreign Policy. By Lippmann. (Hamish Hamilton; 6s.)
Economic Survey, 1949. Cmd. Paper 7647/49. (H.M.S.O.; 1s.)

CATEGORY "B"

On Active Service in Peace and War. By Stimpson. (Hutchinson; 25s.)
The White House Papers of Harry L. Hopkins. By Sherwood. (Eyre & Spottiswoode; 25s.)
The Gathering Storm. By Churchill. (Cassell; 25s.)
Their Finest Hour. By Churchill. (Cassell; 25s.)
Inquest on an Ally. By Winterton. (Cressett Press; 12s. 6d.)
What do You think about Communism? By Hollis. (Conservative Political Centre; 6d.)
Survey of History. By Toynbee. (Oxford University Press; 25s.)
Authority and the Individual. By Russell. (Allen & Unwin; 6s.)
The West at Bay. By Ward. (Allen & Unwin; 12s. 6d.)
The Industrial Future of Great Britain. Lectures. (Europa Publications; 15s.)
Ambassador on a Special Mission. By Templewood. (Collins; 16s.)
The Congress of Vienna. By H. Nicolson. (Constable; 18s.)
Munich. By Wheeler-Bennett. (Macmillan; 25s.)
Years of Victory. By Bryant. (Collins; 12s. 6d.)
Years of Endurance. By Bryant. (Collins; 12s. 6d.)
British History in the Nineteenth Century and After. By Trevelyan. (Longmans; 21s.)
English Society History. By Trevelyan. (Longmans; 21s.)
The British Achievement in India. By Rawlinson. (William Hodge; 15s.)
Thieves in the Night. By Koestler. (Macmillan; 10s. 6d.)
The Expansion of Europe into the Far East. By Pratt. (Sylvan Press; 10s. 6d.)
A Short History of the Middle East. By Kirk. (Methuen; 16s.)
Nisi Dominus. By Barbour. (Harrap; 8s. 6d.)

Other books which will also interest officers are:

WAR: HISTORIES AND SOURCES

The Royal Air Force in the World War. By Norman MacMillan. (Harrap):
Vol. I: Period 1919-1940. (10s. 6d.).
Vol. II: Period 1940-1941. (12s. 6d.).
Vol. III: Period 1940-1945. (15s.).
Vol. IV: Campaigns in the Middle East, North Africa, Italy and the Balkans. (15s.).

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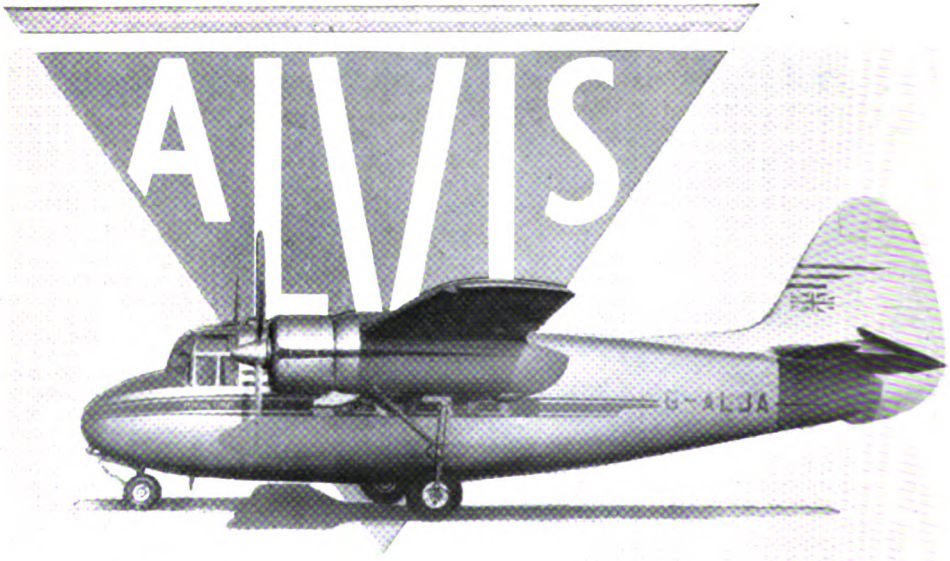

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War in Three Dimensions. By Air Vice-Marshal E. J. Kingston-McCloughry. (Jonathan Cape; 10s. 6d.) Covers all aspects of modern warfare. The author is at present S.A.S.O., Fighter Command.

Ack-Ack. By General Sir Frederick Pile. (Harrap; 18s.) An account of Britain's defences against air attack during the Second World War. The author was G.O.C.-in-C., Anti-Aircraft Command, from 1939 to 1945.

The Green Beret. By Hilary St. G. Saunders. (Michael Joseph; 15s.) The first full-length authoritative account of the Commandos.

For Valour. By Kenneth Hare-Scott. (Peter Garnett; 10s. 6d.). Contains well-written accounts of some of the deeds that have earned the Victoria Cross.

NAVAL

Notes on the Royal Navy. No. B.R.1868(49), issued by the Tactical and Staff Duties Division, Naval Staff, Admiralty. Is not for sale, but may be obtained in small quantities, through unit and formation air publications officers, from A.P.F.S., Kidbrooke. This publication supersedes Air Ministry Pamphlet 245.

ATOMIC ENERGY

Atomic Energy, Its International Implications. By Professor J. D. Cockcroft and ten other authorities. (R.I.I.A.; 4s.) This publication is the result of a study group at Chatham House.

The Military and Political Consequences of Atomic Energy. By Professor P. M. S. Blackett. (Turnstile Press; 12s. 6d.) This is an analysis, by a recognized authority, of the probable influence of mass-destruction weapons on warfare and of their warfare and of their political implications.

THE BRITISH WAY OF LIFE

The English People. By D. W. Brogan. (Hamish Hamilton; 10s. 6d.). Written in 1941 and published in 1943 to meet, by enlightenment, American criticism of the English people. It is as valuable now as it was then.

The English Enigma. By Dorothy S. Ward. (Arthur Barker; 8s. 6d.) An American woman's record of the opinions she has heard in shopping queues, village shops, pubs, restaurants and the House of Commons.

The English Way. By Pierre Mailland. (Oxford University Press; 10s. 6d.) Contains thoughtful studies of English social life by a French newspaperman who has lived for years in England.

The Amazing English. By Ranjee Shahani. (A. & C. Black; 8s. 6d.) This book contains observations of English characteristics in manners, fashions, thought and religion by an Indian woman journalist who draws the conclusion that Indian and English culture have much in common.

England, the Mysterious Island. By Paolo Treves. (Gollancz; 9s. 6d.) An attempt, by an Italian who was a political exile in England during the war, to explain to Italians British manners, customs and political institutions.

This England: 1946-1949. (Turnstile Press; 2s.) A selection from the well-known *New Statesman* feature displaying the follies and foibles of the English by means of cuttings from the national Press.

U.S.S.R.

The Soviet Air Force. By A. Lee. (Duckworth; 8s. 6d.) An assessment of the functional efficiency of the Soviet Air Force.

Behind Europe's Curtain. By John Gunther. (Hamish Hamilton.) An eye-witness report of life in the countries dominated by Russia.

The Foreign Policy of Soviet Russia, 1929-1941. By M. Beloff. (Oxford University Press; Vol. I, 1929-36, 15s.; Vol. II, 1936-41, 21s.) Issued, under the auspices of Chatham House, for serious students only.

Life in Russia. By J. Lawrence. (Allen & Unwin; 12s. 6d.)

WORLD AFFAIRS

India, Pakistan and the West. By P. Spear. (Oxford University Press; 5s.) This book provides a background to the understanding of modern India and Pakistan and gives an appreciation of the synthesis of Eastern and Western cultures.

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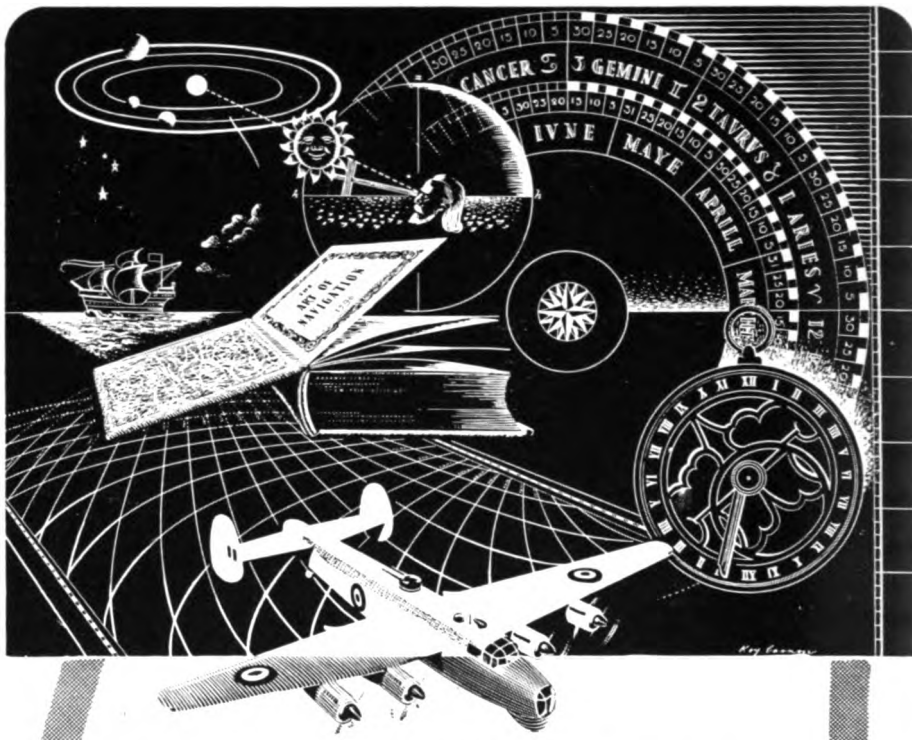

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The Aeroplane Directory of British Aviation, 1950. 574 pp. (Temple Press Ltd., London; 10s. 6d. net.)

The Magic of a Name. By Harold Nockolds. 283 pp. (G. T. Foulis & Co. Ltd., London; 25s. net.) Published 10th March, 1950. This is a fascinating story of one of the greatest industrial concerns in the world—Rolls-Royce.

Must We Hide? By R. E. Lapp. 182 pp. (Addison-Wesley Press, Cambridge, Mass., U.S.A.) A study of the atomic-bomb question by one associated with the project from its earliest days.

Nationalization in Practice. By John Longhurst. 227 pp. (Temple Press Ltd., London; 12s. 6d. net.) An examination of the practical problems of the civil aviation experiment.

SECOND WORLD WAR

Roosevelt and the Russians. The Yalta Conference. By Edward R. Stettinius jun. 320 pp. (Cape, London, 1950.)

Merchantman Rearmed. By Sir David W. Bone (Master Mariner). 322 pp. (Chatto & Windus, London.)

Politics, Trials and Errors. By Lord Hankey. 150 pp. (Pen-in-Hand Books, Oxford, 1949.)

INTERNATIONAL AFFAIRS

Peacemaking in Perspective. (From Potsdam to Paris.) By F. W. Pick. 251 pp. (Pen-in-Hand Publishing Company, Oxford, 1950.)

The Atlantic Pact. By H. L. Hoskins. 104 pp. (Public Affairs Press, Washington.)

SCIENCE AND WAR

Modern Arms and Free Men. A discussion of the role of science in preserving democracy. By Vannevar Bush. 274 pp. (Simon & Schuster, New York.)

U.S.S.R.

Military Attaché in Moscow. By Richard Hilton. 232 pp. (Hollis & Carter, London.)

GERMANY

The Struggle for Germany (Post-War Administration). By Drew Middleton. 304 pp. (Bobbs-Merrill, New York.)

Account Settled. By Dr. H. Hjalmar Schacht. 327 pp. (George Weidenfeld—Nicholson, London.)

MIDDLE EAST

Arabs, Oil and History. The story of the Middle East. By Kermit Roosevelt. 271 pp. (Gollancz, London.)

Hate, Hope and High Explosives. By G. F. Eliot. 284 pp. (Bobbs-Merrill, New York.) A report on the Middle East following a visit in the spring of 1948.

EUROPE

Tito. By G. Bilainkin. 287 pp. (Williams & Norgate, London, 1949.)

GOVERNMENT

The Two Constitutions. By H. Stannard. 210 pp. (A. & C. Black, London; Van Nostrand Co., New York.) A comparative study of the British and American constitutional systems.

Freedom and Organization, 1814—1914. (An attempt to trace the main causes of political change during the hundred years from 1814 to 1914.) By Bertrand Russell. 528 pp. (Allen & Unwin, London, 1949.)

U.S.A.

Strategic Intelligence for American World Policy. By Sherman Kent. 226 pp. (University Press, Princeton, U.S.A., 1949.)

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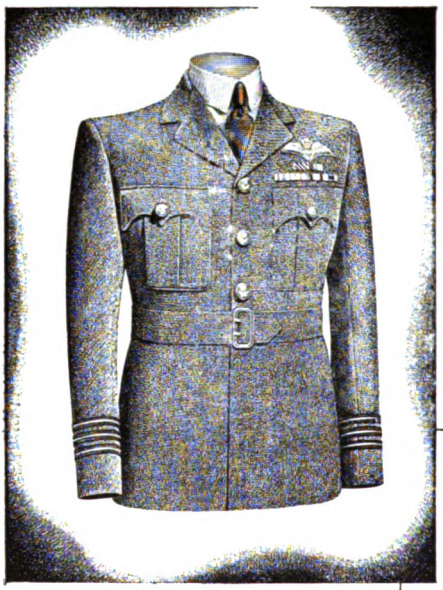

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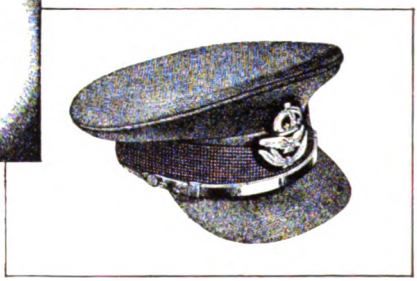

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"R.U.S.I. Journal," November, 1949

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"The Soviet Armed Forces," by Major-General R. Hilton.

"Target for Tomorrow," by J. M. Spaight.

"Air Power in Economic Warfare," by "Aquila."

"The Royal Air Force Regiment," by Air Vice-Marshal H. T. Lydford.

"Officer Selection," by Colonel C. M. Maclachlan.

"Milestones of Military Aviation, 1949-50," by Group Captain C. W. Williamson.

"Flight"

10th November, 1949:

"Air Defence," by Marshal of the Royal Air Force Lord Tedder.

17th November, 1949:

"Air Defence at the Cross-roads: Problems of Interception in the Jet-Bomber Era," by "Bellerophon."

"Aircraft Design, Development and Production," by Sir Frederick Handley Page. Part I.

24th November, 1949:

The same, Part II.

"The Aeroplane"

11th November, 1949:

"Air Defence," by Marshal of the Royal Air Force Lord Tedder.

"Oil Supplies in War," by Major-General W. E. V. Abraham.

"The Soviet Armed Forces," by Major-General R. Hilton.

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"Air Lines of the World," Anon.

"Fortnightly," November, 1949

"Policy in the Middle East," by H. S. Deighton.

"Economist," 26th November, 1949

"An Army for Germany," Anon.

"Inter Avia," October, 1949

"Was Douhet Right?" by "R. K."

"Soviet Aviation Day, 1949, and What it Means" (correspondent's report).

"Aeronautical Engineering Review" (U.S.A.), October, 1949

"The Earth's Atmosphere," by Howard E. Roberts.

"Aero Digest" (U.S.A.), October, 1949

"Climate Unlimited," by Lieutenant-Colonel L. F. Tanberg, U.S.A.F.

"Ordnance" (U.S.A.), November-December, 1949

"America's Air Defence," by Major-General G. P. Saville.

"Army Quarterly," January, 1950, pp. 178-185

"The British Expedition to Greece, 1941." A lecture to the Anglo-Danish Society in Copenhagen by Field-Marshal Earl Wavell.

"Foreign Affairs" (U.S.A.), January, 1950, pp. 309-326

"The Battle for Moscow, Turning Point of the War," by Vice-Admiral Kurt Assman.

"Fighting Forces," January, 1950, pp. 229-231

"The Atomic Warfare Situation," by Major E. W. Sheppard.

"Aeroplane," January, 1950

"General H. H. Arnold (U.S.A.F.)." An obituary and a review. By C. G. G.

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EDITOR.

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A Meteor IV (with two Avon jet engines) flies over Farnborough Aerodrome, the site of the 1950 Air Display. In the aircraft park can be seen some of the Aircraft Industry's latest types

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EDITORIAL

FOR so great an occasion as The Royal Air Force Air Display, it is with some bashfulness that we attempt our Editorial.

Having obtained some encouragement, however, from the following, written by Plutarch nearly 2,000 years ago, we begin the task feeling that at least some critics may have been disarmed.

> *"It is a thing of no great difficulty to raise objections against another man's oration—nay, it is a very easy matter, but to produce a better in its place is a work extremely troublesome."*

THE ROYAL AIR FORCE AIR DISPLAY

What a vast field of activity that title "Air Display" covers! And how much lies behind the pageantry of the occasion.

It is something more than a meeting-place for past and present members of the Royal Air Force, or a forgathering of those now slightly bald or grizzled members of the Royal Flying Corps and Royal Naval Air Service.

Even more lies behind it than the opportunity for craftsmen to gaze upon the finished product of that which they have laboured so long to produce.

It even transcends the social aspect given to it by our old sweethearts and present wives, who attend in staggering creations and whose attractiveness add to the pageantry of the occasion.

We must look deeper to find the real object behind this annual event.

Let us pause to consider the scope of the preparations which end in our Air Display and, more important, what the Royal Air Force does, in fact, display at the annual Air Pageant.

As a special article appears later in this journal on the preparations, we will not attempt to give details of the work involved thereby, but content ourselves by touching upon what is shown to those who attend at Farnborough and what lies behind the demonstration. Thousands witness for themselves the skill of our pilots, the advance in design and performance of our aircraft, and are given visual proof of the efficiency of the men and equipment of this country's "First Line of Defence." The taxpayers are enabled to judge for themselves whether their contributions to this part of our country's defence has been used to good purpose. What they see at Farnborough on such an occasion are some of the results of the team work of the Administrative, Flying and Technical branches of the Royal Air Force. All personnel, from the highest staff officer to the humblest "erk," play their part in full measure, and it is by team work, and team work alone, that the highest peak of efficiency is attained.

That our standards should be superior to those of other nations is vital to our existence as a nation, possibly more so today than in the past. Only by maintaining our lead in the quality and performance of our aircraft and its technical equipment, and the skill of those who maintain and use them, can we hope to survive in any conceivable war of the future.

In comparison, ours is a very small fighting force, and yet, looking back through history, it was ever thus. We do not win our battles by numerical superiority, but by the courage, endurance and skill of our men and the efficiency of the arms with which they are provided.

How often have we, like David, faced by the somewhat fearsome bulk of Goliath, by fearlessness, speed of action and uncanny accuracy with our

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weapons, emerged as triumphant as he did. Our bowmen at Crécy, our small but unconquerable ships in the Armada, our numerically inferior Air Force in the Battle of Britain, all helped to prove that victory is not necessarily won by those possessing the greatest number of fighting men.

We must not, however, let these thoughts lull us into complacency. There comes a time when the preponderance of strength reaches a point that would endanger the more efficient force; by overwhelming it by sheer weight of numbers alone. It is essential, therefore, that we should ever have in mind two essentials when considering our Air Force and any conceivable future war.

Firstly, efficiency. This necessitates the provision of the country's best men for the Air Force, which involves providing it with the most highly skilled technicians that this country can produce and men of the right quality for our aircrews. Further, it demands the maintenance of our aircraft industry in a state of the greatest possible efficiency and the necessary funds for the improvement of design of aircraft and engines. We must continue to advance ahead of other nations in the design and production of all the equipment essential to our Air Force, such as armament, radar, etc. All this must be done to the fullest possible extent of our national economy.

This may demand some sacrifices in other quarters; many improvements in our national life may have to be postponed while this threat of war overhangs us, but unless this is done, every intelligent man knows today that we shall not enjoy for very long that higher standard of living we now strive for: we may, indeed, lose our freedom and a vast number of us our lives. An efficient Air Force is a safeguard against this.

The second essential is to maintain an Air Force sufficiently strong numerically to enable it to have some chance of fulfilling its role as our "First Line of Defence" under conditions and against odds that can now be reasonably assessed. To some extent this second essential depends, not upon our Government but upon every citizen; there must be created *a desire* to serve; compulsory service will avail us little. Our needs can be met by the co-operation of parents, schoolmasters, and the influence of the man in the street and, even more, by the women of this country. Send us your young men with zeal in their hearts to serve their country, that must be their foremost thought; the recruits' interest will soon be captured by the task in hand, and pride in their Service will follow.

To those who have some anxiety and old prejudices against flying, we can only say there is less danger in it today than in crossing a busy London street—and, should our gloomiest forebodings be realized and war come to this land, is it not better to be able to strike a blow in one's own protection and that of those dear to us rather than to be numbered among the sheep? Let us look back and remember our comrades of the past, those heroes who made the Royal Air Force the finest air force in the world." What greater sacrifice can a man make than he that lays down his life for his friends?"

In conclusion, we would draw your attention back to the Royal Air Force Display and the realization that those taking part are a fair example of the men who form our Royal Air Force, a Service of which we are justly proud, with a tradition behind it second to none. Looking back through two wars we can say with some justification that it has been "Per Ardua ad Astra," but today our struggle is not so arduous and we are certainly getting nearer to the stars!

Writing this Editorial some two months before the event, it is with confidence that we look forward to the younger generation's air display, knowing that they will maintain the very high standard of the tradition of past years.

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THE R.A.F. DISPLAY

A GLANCE BACKWARDS

THE Royal Air Force Display, to be held at Farnborough, Hants, on 7th and 8th July, is the first full-scale demonstration staged by the Service since the 1937 Hendon Display. Compared with Hendon, most of the aircraft taking part will be more than twice as fast, the programme will be wider in scope and contain more items.

The annual Hendon Display was abandoned in 1937 after running without a break since 1920. It had become one of the main features of the aeronautical year, reflecting not only the standard of training and flying skill in the Service, but also the yearly progress in aircraft design. The same skill will be demonstrated at Farnborough, by pilots flying aircraft which represent a remarkable contrast with those seen at the final Hendon Display.

In 1937, when the jet engine had barely progressed beyond the design stage and was to remain a closely guarded secret for more than five years, most of the fighter events were performed with Gloster Gauntlets and Hawker Furies, with maximum speeds of 230 m.p.h. At Farnborough, many of the fighters will be Gloster Meteors and de Havilland Vampires, capable of between 500 and 600 m.p.h. The light bombers of 1937 were 185 m.p.h. Hawker Hinds. Today they are 400-m.p.h. de Havilland Mosquitos, with the jet-propelled Canberra, shortly to come into service, also on show.

The pre-war displays fall into three distinct phases. For the first few years the aircraft flown were those which had become famous in the First World War—Sopwith Camels and Snipes, S.E.5A's, D.H.9A's, Avros and Bristol Fighters. Members of the public could fly as passengers in many events on payment of charges up to ten guineas a seat. In the middle 1920's the squadrons started to re-equip with the familiar post-war types—Gloster Grebes and Gamecocks, Armstrong Siddeley Siskins and Fairey Flycatchers, closely followed by the Fairey Foxes, Bristol Bulldogs, Hawker Furies and Harts.

The 1936 Display ushered in the monoplane era, and among those shown at Hendon were prototypes of some of the Second World War aircraft. They included the Hawker Hurricane, Supermarine Spitfire, Fairey Battle, Handley Page Hampden, Vickers Wellington, Bristol Blenheim and Armstrong Whitworth Whitley.

To students of R.A.F. history there is much interest to be derived from studying the names of the pilots listed as taking part in the pre-war displays. In 1920 they included Flight Lieutenant J. C. Slessor (now Marshal of the Royal Air Force Sir John Slessor, Chief of the Air Staff), Flight Lieutenant J. M. Robb (now Air Chief Marshal Sir James Robb, C.-in-C., Air Forces, Western Europe), Squadron Leader W. S. Douglas (now Marshal of the R.A.F. Lord Douglas of Kirtleside), and Flying Officer W. A. Coryton (now Air Marshal Sir Alec Coryton, Controller of Supplies (Air), Ministry of Supply). In 1924, Flight Lieutenant G. C. Pirie (now Air Chief Marshal Sir George Pirie, Head of the Air Force Staff, British Joint Services Mission, Washington), and Flight Lieutenant L. N. Hollinghurst (now Air Marshal Sir Leslie Hollinghurst, Air Member for Personnel) were members of the R.A.F. Staff College team in a flying relay race. In 1931, Flight Lieutenant B. E. Embry (now Air Marshal Sir Basil Embry, A.O.C.-in-C., Fighter Command) led a demonstration of inverted flying.

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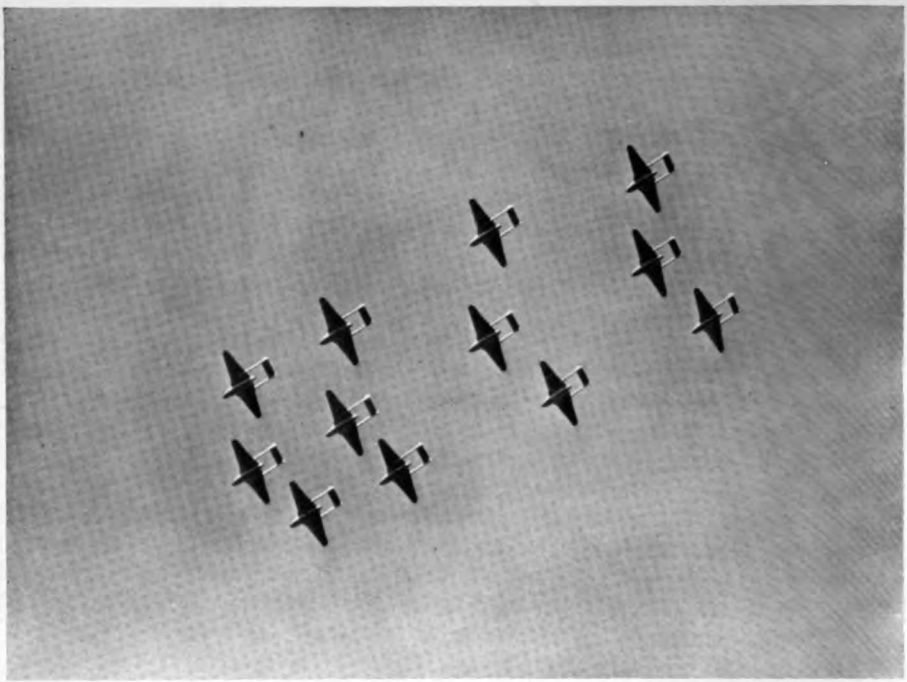

[Air Ministry Photo

Vampires of No. 11 Fighter Group in formation. (From No. 601 County of London Squadron and No. 604 County of Middlesex Squadron.) The formation is led by Squadron Leader P. H. M. Richey, D.F.C., Officer Commanding, No. 601 Squadron

[Air Ministry Photo

Pilots of No. 504 Nottingham Squadron draw your attention to something of obvious interest away up there

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WHAT YOU WILL SEE

A reconstruction of the attack on Amiens prison in February, 1944, when a formation of Mosquitoes liberated French patriots under sentence of death, by breaching the prison walls in a low bombing attack, will be one of the high-lights of the Royal Air Force Display, to be held at Farnborough, Hants, on 7th and 8th July. The King and Queen will attend during the afternoon of Friday, 7th July.

The Display, starting at 10.30 a.m. and lasting until 5.30 p.m., will consist of twenty-seven events. The ten morning events will include six devoted to R.A.F. ground activities, and all the seventeen afternoon events will be flying items.

Flying will include individual and formation aerobatics by Meteor and Vampire jet fighters, large formation fly-pasts by representative aircraft drawn from thirty-five regular and auxiliary squadrons, "crazy" and precision formation flying by instructors, a helicopter circus, demonstrations by the new Venom jet fighter-bomber and Canberra twin-jet bomber (both in production for the R.A.F.), and by two research aircraft. Veteran aircraft dating from the First World War and earlier will be demonstrated, as well as a modern high-performance sailplane.

In addition to the reconstruction of the Amiens prison raid, other events showing R.A.F. operational techniques will include an attack on a strong-point by armoured cars of the R.A.F. Regiment and Vampire fighter-bombers, and a spirited defence of the airfield when attacked by "hostile" Mosquito bombers.

The aerobatics will be performed by the most skilful pilots of the R.A.F., selected by competition from the various squadrons and flying units.

The Royal Auxiliary Air Force will have a prominent place in the Display. The final of the Cooper Trophy high-speed handicap race—an annual event for the 20 R.Aux.A.F. fighter squadrons—will be flown on the Friday. On the Saturday this event will be replaced by air drill, executed by two auxiliary squadrons. The R.Aux.A.F. will also participate in the Amiens prison event and the fighter section of the fly-past.

R.A.F. Volunteer Reserve pilots will demonstrate the aerobatic capabilities of their new de Havilland Chipmunk trainer, and cadets of the Air Training Corps will give a gliding display.

Ground events will include a demonstration by R.A.F. Police dogs, physical training by the Women's Royal Air Force, mortar firing by the R.A.F. Regiment, and a mass physical training display by R.A.F. recruits. Nine R.A.F. bands, the Central Band of the W.R.A.F., and the massed bands of the Air Training Corps will also take part in the morning programme. A Royal Air Force exhibition on the airfield will be open from 9 a.m. to 7 p.m.

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[Air Ministry Photo

Air Marshal Sir Basil E. Embry, K.B.E., C.B., D.S.O., D.F.C., A.F.C., Air Officer Commanding-in-Chief, Fighter Command

[Air Ministry Photo

Air Marshal Sir Hugh Lloyd, K.B.E., C.B., M.C., D.F.C., Air Officer Commanding-in-Chief, Bomber Command

[Air Ministry Photo

Air Marshal Sir John W. Jones, K.C.B., Air Officer Commanding - in - Chief, Technical Training Command

[Air Ministry Photo

Air Vice-Marshal R. O. Jones, C.B., A.F.C.
Air Officer Commanding No. 24 Group

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PLANNING A ROYAL AIR FORCE DISPLAY

By Air Vice-Marshal W. M. Yool, C.B., C.B.E.

THE decision that a Royal Air Force display would be held in 1950 was announced in Parliament during the debate on the 1949 Air Estimates, and an Air Ministry Committee was set up shortly thereafter to consider the problems involved, and to start detailed planning. Work on the planning of the display thus began over a year before the date the display was due to take place.

Displays had been held annually at Hendon from 1920, when the then Chief of the Air Staff, Lord Trenchard, initiated the first one, to 1937, when the eighteenth display marked the end of the series. They had given millions the opportunity of seeing something of the activities of the Air Force, and had provided the rallying point for the great annual reunion of past and serving members of the Force. But the shadow of the coming struggle was looming larger. Expansion was in full swing, and the display did dislocate training to a considerable extent. Added to this the time was fast approaching when Hendon, an airfield incapable of any great expansion, would be too small for the more modern types of aircraft then coming into service. The decision had, therefore, regretfully to be taken to abandon the display.

In the thirteen years that had passed since then most of the records of the past displays had been lost, and the committee, although they were able to obtain the advice of a few people who had been concerned with the running of the pre-war displays, had practically to start from scratch. Many new problems had to be considered, the foremost of which was the question of where the display was to be held.

The airfield selected had to be large enough for modern aircraft, and yet sufficiently near to the London area to ensure that it would be reasonably accessible to large numbers of the public. There is no Royal Air Force airfield in the area that is suitable, and civil airfields, such as Heath Row and Northolt, obviously could not be made available, because of the interference which would result to civil flying. Furthermore, the use of any airfield within the London Air Traffic Control area is undesirable, because, in the event of bad weather, the display would almost certainly have to be cancelled entirely, as it would not be practicable to operate the aircraft taking part in the display under the London Air Traffic Control.

Farnborough was the airfield that best answered the requirements. It had already been used for the annual show of the Society of British Aircraft Constructors, who will be holding their 1950 show there again in September. Farnborough, however, is not a Royal Air Force airfield, but the Ministry of Supply, to whom it belongs, very kindly consented to its being used, in spite of the interference that will inevitably be caused to the work of the Royal Aircraft Establishment.

The location settled, the next questions that had to be decided were the date of the display and the form that the programme should take. Many factors had to be taken into consideration in deciding upon the date. It had to be in what was likely to be a good weather period; it should not, if possible, clash with any other major attraction; the main holiday month of August, when many people would be away, had to be avoided; and the possibility of interference with any large-

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scale air exercises had to be taken into consideration. In the end, 7th and 8th July were decided upon, with the dress rehearsal on 5th July. The Hendon displays had been held on one day only, but this time it was decided to hold the display on two consecutive days, as it was felt that, in view of all the effort required to produce the display, as many of the public as possible should be given the opportunity of attending.

Concurrently with the consideration of the most suitable date, the form of the programme was being worked out. The Air Council, in setting up the Display Committee, had expressed the wish that the display should be on an impressive scale, and that it should be fully representative of the Service, both in the air and on the ground. The intention that the display should also cover the ground activities of the Royal Air Force introduced a new element, in that the pre-war displays, apart from small aircraft parks, had been confined to the flying events. Two sub-committees were therefore formed, to consider proposals for the flying and ground parts of the programme, and to submit their suggestions for the co-ordinated programme to the main committee.

The programme, as eventually approved by the Air Council, included an exhibition illustrating various aspects of the activities and achievements of the Royal Air Force, aircraft parks where the types of aircraft in service could be seen at close quarters, and a series of ground events in the morning, the principal items of which were a massed physical training display, and the massed bands of the Royal Air Force. The main flying programme was to be in the afternoon, but certain flying events were interspersed with the morning programme, in order that those arriving early would see some flying in progress. In addition, it was decided that, in view of the close association existing between the Royal Air Force and the United States Air Force, they should be invited to take part in the display, and that similar invitations should be extended to the countries of the Commonwealth and of Western Union.

Owing to the distances involved some of the countries of the Commonwealth were unable to accept the invitation, but one or two will have aircraft in the fly-past, and Commonwealth crews are also flying R.A.F. aircraft in this and certain other events. The air forces of Western Union will also probably be represented in the fly-past.

The programme as finally approved may appear somewhat long, but this was done deliberately, so as to endeavour to spread the arrival and departure of spectators over as long a period as possible, in view of the comparatively restricted road approaches to Farnborough. In addition, by opening the gates and the exhibition at 9 a.m., and keeping them open until 7 p.m., the public will be given the opportunity of visiting the exhibition and aircraft parks without the distraction of having flying events in progress at the same time. There will be so much to see in the exhibition, however, that it is probable that many people will come to the display on both days, so as to have ample time to see both aspects of the display.

Once the form of the programme had been approved, the detailed implementation of the air and ground aspects respectively was delegated to the Air Officers Commanding-in-Chief, Fighter and Technical Training Commands, Air Marshals Sir Basil Embry and Sir John Whitworth Jones, who, in turn, appointed the Senior Air Staff Officer, Fighter Command, Air Vice-Marshal D. F. W. Atcherly, and the Air Officer Commanding No. 24 Group, Air Vice-Marshal R. O. Jones, to be directly responsible for the air and ground parts of the programme. The latter was also made responsible, under the Commander-in-Chief, Technical Training Command, for the considerable administrative arrangements

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necessary at Farnborough for the reception of the spectators, and the accommodation of those taking part in the display.

The administrative arrangements had to be planned from the beginning, as there was no previous experience to go upon. As it was obvious that a considerable amount of detailed planning would have to be done, particularly on the arrangements for the spectators, which could only be done at Farnborough, a Display Unit was formed in nucleus at Farnborough in January, under the command of Group Captain W. A. J. Satchell, which was gradually built up as necessary. Thanks to the very helpful co-operation and assistance of the General Officer Commanding Aldershot District, Major-General W. A. Dimoline, the problem of accommodating the personnel taking part in the display was solved fairly easily, but the making of the arrangements for the reception of the spectators presented a much bigger task.

To begin with, the number of spectators likely to attend, and the number of cars, were unknown quantities. Some guidance was obtainable from the numbers attending the S.B.A.C. show in 1949, and many other authorities, including the railway and road transport organizations and the police, were consulted. In view of the uncertainty it was obviously essential to plan on the high side, and in the end it was decided to plan on a maximum figure of 200,000 people and 25,000 cars being present on any one day. Even this figure left a slight margin in hand, so there should be little risk of anyone wishing to see the display being turned away. How accurate the estimate of the attendance will prove should be known shortly after these lines appear in print.

Once the attendance figures had been estimated it was possible to make a start on the detailed planning of the spectator arrangements. The configuration of the ground at Farnborough is such that it does, to some extent, form a natural arena, but on the other hand there is a lot of dead ground from which the airfield cannot be seen. In planning the lay-out of the spectator enclosures it was therefore necessary to ensure that there was sufficient room for every spectator to get a view of the airfield, and it was also possible to site some of the car parks in positions from which a view could be obtained. The exhibition and aircraft parks, the remaining car parks, refreshment facilities, club tents, etc., were sited on the dead ground.

The exact layout could only be finally decided by a detailed survey on the ground, and this was made by the Display Unit, whose recommendations were approved by the main committee. Following on this the letting of the contracts for the various requirements for the spectator enclosures, such as fencing, turnstiles, refreshment and other facilities, was put in hand, and arrangements were made with the Post Office for the installation of a number of telephone kiosks for the use of the public and the Press. These were in addition to the numerous signal requirements of the Air Force in connection with the display. At the same time as work was proceeding on the spectator enclosures, arrangements were being made for the printing and sale of tickets, and for a publicity campaign advertising the display to be launched.

The arrangements for the spectators were carried out in close co-operation with the Royal Air Force Benevolent Fund, who had been invited by the Air Council to assume responsibility for the spectator arrangements, the Fund receiving, in return, the proceeds of the display. The Benevolent Fund, in effect, therefore acted as the agents of the Air Ministry in regard to certain of the spectator aspects of the display, their proposals as they arose being approved by the main committee.

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Concurrently with the planning of the administrative arrangements, work was proceeding on the flying and ground programmes, and the exhibition. To deal with the latter first, Commands were invited to submit suggestions for the inclusion of items that were thought to be of interest to the public, and from these items were selected which should provide a comprehensive survey of the activities and achievements of the Royal Air Force. The exhibition will be housed in a large hangar, and will include exhibits illustrating recent peace-time achievements, a demonstration of Fighter Control Units and an Operations Room, various trainers and a signals section showing the latest radio and radar equipment. In addition, other items will be exhibited in smaller hangars, and in mobile vans, and various types of aircraft, ranging from veterans of the First World War to those in service today, will also be on view. Altogether the exhibition is as comprehensive as it is reasonably possible to make it.

The ground events of the programme required a good deal of rehearsing, but fortunately this could be done in the main at the stations where those taking part were located, bringing them together for final rehearsals in the week the display takes place.

The rehearsing of the flying events presented more difficulty. All the Commands at home and British Air Forces of Occupation, Germany, will be represented, and in addition there will be the aircraft from the Commonwealth, the United States and Western Union. This, in turn, involved making arrangements for the accommodation of the air and ground crews of the aircraft coming from abroad. The use of a neighbouring airfield was also required for the aircraft taking part in some of the events, and the Ministry of Civil Aviation kindly placed Blackbushe at the disposal of the Air Ministry for this purpose.

Then, before the rehearsals proper could start, eliminating contests had to be held for some of the events. Competition to take part in the display was naturally keen, and this seemed to be the fairest way of ensuring that everyone was given the opportunity of taking part, and that the best crews would appear in the display itself. The eliminating contests over, rehearsals began in earnest, and as aircraft from several squadrons and different commands were taking part in some of the events, such as the two set pieces, the attack on a strong-point and the attack on Amiens prison, and the fly-past, a great deal of organization was required to assemble the aircraft for the various events at the airfields selected for the rehearsals.

Gradually, however, the display began to take shape, as the rehearsals for the flying and ground events, the preparations for the exhibition, and the arrangements for the spectator enclosures, proceeded concurrently. Although some of those taking part in the ground events will assemble at Farnborough at the beginning of the week of the display, the first time that it will be possible to try out every aspect of the display as a co-ordinated whole, will be at the dress rehearsal on the Wednesday preceding the display. It can be seen, therefore, how much depends upon the thoroughness of the preliminary preparations, if everything is to run smoothly on the day.

The dress rehearsal will also provide an opportunity for the youth of Britain to see the display free of charge. Invitations are being issued to the Air Training Corps, the various youth organizations, and the public and other schools. At the same time the rehearsal will enable the spectator arrangements in general to be tried out, as the numbers attending are expected to approximate to those likely to attend on the Friday which, in turn, will give those responsible for the enclosures and the control or traffic further practice before dealing with the still larger attendance expected on the Saturday.

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[*Air Ministry Photo*

After judging the aerobatics by Auxiliary Squadrons in rehearsals for the Air Display at Farnborough. On the right is the winner, No. 12 Group (17 A.A. Co-operation Squadron), Spitfire pilot, Pilot I Posta. On the left is the runner-up, Flight Lieutenant G. Hulse, pilot of a C.F.S. Balliol aircraft

It can be seen, however, that the mounting of the display, although it has raised certain new problems, has been handled in much the same way as any other operation or exercise, and that the normal channels of control and staff practice have been followed. Before the war there was a display secretary, with a small permanent staff. This was probably the best way of organizing the display when it was an annual event, but did not appear to be appropriate to the changed conditions of today, when it seems unlikely that it will be possible to stage a display, except at fairly long intervals.

This article has perforce had to be written some time before the display takes place, but the preliminary planning had been completed and the shape and scope of the display decided upon. A great deal of hard work had, however, still to be done before the display could be welded into a composite whole, and the degree of success attained by the concerted efforts of all concerned can be judged on Friday, 7th July, the first day of the display, which will be attended by Their Majesties The King and Queen, who will be accompanied by Princess Margaret and the Duchess of Kent.

All that remains is to trust that all goes well on the day, and that the weather runs true to its predicted form. In conclusion, it is hoped that this brief description of the organization behind the production of the display will show that Cromwell's maxim has not been forgotten: "Put your trust in God, my boys, and keep your powder dry."

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[*Photo: Hay Wrightson*

Group Captain G. L. Cheshire V.C., D.S.O., D.F.C.

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V.Cs. OF THE AIR

GROUP CAPTAIN GEOFFREY LEONARD CHESHIRE, V.C., D.S.O., D.F.C.

By Kenneth Hare-Scott

"THE greatest bomber pilot the world has ever known," was how the newspapers hailed Cheshire when he was awarded his V.C. in 1944. It is easy to arrive at such a superlative when reviewing the remarkable flying career of a very remarkable man. You will see why I use the same description for the man as for his deeds when you read on. It is not all about flying.

Leonard Cheshire was born in 1917 and spent his childhood in Oxford, where his father, a Professor and well-known scholar, was Don and Bursar of Exeter College. From the Dragon School he went to Stowe, where a contemporary records that "he was a pleasant, normal type, quite inconspicuous. When he became famous in the war I had to think hard to remember him." He was, and still is, a very good tennis player, representing his school and later nearly getting a "blue." From Stowe he went to Germany for a year, where he lived at Potsdam with Admiral von Reuter, who scuttled the German Fleet at Scapa Flow. He remembers the Admiral's comment at lunch one day: "Only five per cent of mankind is worth living; the rest should be put down. War is a very good way to get rid of the rabble." Cheshire was a little horrified to hear this, but reflected as he told me of the incident that the Admiral did not live to see the fruits of his philosophy, nor did his three sons, who were killed in the war.

Returning from Germany he went up to Merton College, Oxford, and entered upon a wild and irresponsible phase of his career. A fast sports car, pints of beer, sensation, and not very desirable company provided the high spots in his life. A desirable but equally carefree companion was Jack Randle, who was later to win a splendid V.C. in Burma—"the citation brings tears to your eyes when you read it," says Cheshire. The two of them would dodge the traffic of Oxford in a manner calculated to spread terror and confusion in others. To them it was thrilling, a test of nerves. When Cheshire joined the University Air Squadron he discovered that flying satisfied all his longings. And, calming down, he made an excellent pilot. He experienced some delay before he could join the Royal Air Force, and he spent the months impatiently and restlessly at dog tracks, doing nothing in particular but wait for the only life he could now consider—that of the airman. His commission came through in 1939, and the outbreak of war found him in 102 Squadron engaged in bombing bridges, marshalling yards and communications in Germany. For Cheshire, the sun had at last broken through the clouds.

In November, 1940, he was in a raid on Cologne. About to drop a photograph flare, his plane was suddenly rocked by a violent explosion which blew out much of the fuselage and caused fire and intense fumes. The flare had been hit by shrapnel. He went on to drop his bombs before turning for home. On landing safely, he received the first of his many decorations—a "field award" of the D.S.O.

After a tour with Coastal Command he joined 35 Squadron of Halifax bombers and added a D.F.C. to his ribbons before being sent across the Atlantic to

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ferry a bomber back and experience the refreshing breeze of American hospitality. Back again with 35 Squadron he one day settled down to record his impressions of what it was like to be a bomber pilot, the human side rather than the technical. He found the pen flowed easily. *Bomber Pilot*, 50,000 words, written in six weeks, became a best-seller, and soon, with Air Ministry approval, he was contributing a series of thrilling articles to a Sunday newspaper. Britain understood better what it was like to be shot up and shot at, and the comradeship of the air. The life he led inspired him to write with great depth of feeling. In his own submission, he cannot do it now.

In August, 1942, now a Squadron Leader, he was posted to Marston Moor Training Station. He hated it. His weekly agitation to be returned to flying duties eventually brought him a bomber squadron of his own, 76 Squadron, which was to become famous for its raids on the great cities of the Ruhr and in occupied territory. The Wing Commander had a technique of his own in training and assessing his crews. In order to know the individual qualities of each new arrival he abandoned the usual practice of a Squadron Commander flying always with his own experienced team; instead, he took the new boys up with him on their first few flights and so discovered their strength and weaknesses. "I felt it gave them a chance," he says.

He had gained a bar to his D.S.O. when Marston Moor again claimed him, this time as Commander and a Group Captain, the youngest in his Service, for he was still only twenty-five. He was no happier than before, and pressed the A.O.C., Air Vice-Marshal Carr, to let him return to operations again. It took four months, and then, what a reward! He was given command of 617 Squadron, Guy Gibson's famous dam busters. It meant a drop in rank to Wing Commander, but that was no price to secure a squadron in which every man was a volunteer, a mixed bag from Britain, America and the Empire, with the highest qualifications.

Immediately training was started—designed to reach perfection in high-level precision bombing by night with an accuracy average of 30 yards from 20,000 feet (normally it was 200 yards by day!). They made forty-five training flights over targets in Germany, France and Italy, not without casualties. After a distraction in support of the Normandy landings in June, 1944, the special training of the Squadron was resumed. They were given a new 12,000-lb. deep-penetration bomb and told to drop it as their training had taught—*on* the target from 20,000 feet by night. They did so with effect on railways, through tunnels to block them, and on bewildered Munich.

This was Cheshire's revolutionary method. From 700 feet he himself dropped flares to light up the target for his Squadron thousands of feet above. Then, from start to finish, he controlled the attack by wireless, never giving up until accuracy was achieved. In one attack they made sixteen runs before the marker was dropped and the bombing ordered. The method was revolutionary because hitherto target illumination had been done by high-flying aircraft, and to do so at point-blank range, regardless of defences, was suicide in the opinion of most experts. Cheshire says: "In forty-two trips, we only missed once. The reason, the secret, if you like, was flying really low as we'd practised. We used to 'formate' at night below tree level, and often came back with bits of grass, tree, and telephone wire caught on the planes."

Cheshire tells me the Squadron now learned its special targets—the V3 rocket sites which would shortly, it was believed, pump four 500-lb. shells a minute into London. By the method I have described the sites were destroyed, and with his success Cheshire saw the whole technique of Bomber Command change, and

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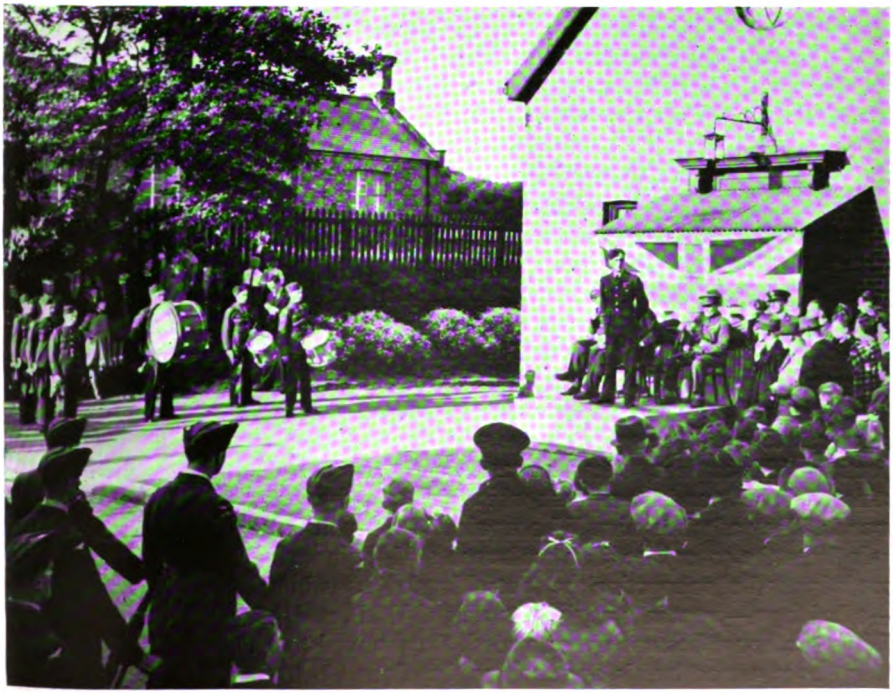
[*Air Ministry Photo*

Flares dropped from Group Captain Cheshire's plane on a German munitions factory



[*Copyright: Yorkshire Post*

Group Captain Cheshire, V.C., speaking at a Wings for Victory meeting in Yorkshire

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other squadrons were attached to him to mark in the main Bomber Command attacks.

It is said that he had an uncanny gift of leadership. He seemed not to give orders so much as suggest each man's duties—and the standard required. They would follow him in anything and any "extra" taken up with his usual crew felt himself as a sinner admitted to heaven. Losses affected him terribly; we understood and left him alone, which is what he wanted.

After the bombing of the rocket sites, Cheshire and all the old hands of the Squadron were taken off operations. He had earlier been awarded a third D.S.O., and now, in recognition of 100 bombing operations—many under conditions of the greatest possible hazard—he was awarded the V.C. and became the most decorated man in the Royal Air Force. The irresponsible Oxford youth had travelled a long way, and, though still young in years, was beginning to show the excessive calm which, today, makes him seem mature and serious beyond his years.

His service with the Royal Air Force was not to end without a fascinating twist. Having been stood down from further flying at home, we find him off to India. "I thought if I could get far enough away I might get back to flying," he says. He did—for one trip over Akyab, then in Japanese territory—before being told to pack his bags again and go on to Washington to join the Joint Chiefs of Staff Mission to work on technical development. Early in 1945 he was chosen to be one of the only two British observers of the dropping of the atom bomb on Nagasaki, an event which, historians may, in its true perspective, see as the salvation of the civilized world; for it is said that faces in the Kremlin, looking hungrily to the oifields of Persia, turned, startled, to the East, and turned white. Cheshire described the bomb-dropping brilliantly in the British and American Press. The horror of the thing disturbed him, and he came home to lecture on the terrible price civilization would pay for another war. "We have no way out except by ruling out the possibility of war," he said. He is a sincere and moving speaker who cannot fail to impress audiences with his quiet delivery, extreme modesty, and latterly, his deep faith in a Power greater than man.

In January, 1946, at twenty-seven, he retired from the Royal Air Force with the rank of Group Captain. He now felt that his duty lay in helping his less fortunate companions in all three Services, and he wrote an article in a Sunday paper about a colony he wanted to found—where all men would have equal status and opportunity, pool resources, pursue crafts and trades, and pull together as they had done in war for the sake of the community. He invited interested ex-Service men to get in touch with him. The response was immediate and overwhelming. V.I.P. (Vade in Pacem) Association was formed, and he accepted all who applied to join the venture.

Men brought their families and chattels to an estate in the Midlands, where a start was to be made, and each member of the Colony put into the pool a proportion of his savings. Cheshire was the skipper and he looked for the same instinctive loyalty and team work which had silently pervaded his war-time commands. They admired him. Who wouldn't? They also looked for some personal gain from the enterprise. The craftsmen sold their wares, but pocketed the proceeds instead of supporting the central fund. Meanwhile, Cheshire's own savings —all of them—went into paying the way of V.I.P. and the wages of the members. When the house became overcrowded, they moved to a larger estate in Hampshire, once owned by his aunt, where they found better amenities but drew no nearer to the ideals of their founder.

Then his health failed and he was ordered away for a complete rest to any

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place of his choice far and remote from all worry. He went to Canada to stay for six months at New Denver, in the Rockies, with Bishop Embling and his family. The peace and beauty of his surroundings, and the warmth of hospitality, brought new health to mind and body. He spent his time tree felling, walking and fishing. Then a cable came one day from a friend at V.I.P. telling him that all was not well and that, when fit enough, he should return. It sounded urgent.

Back in Hampshire he found that his dream Colony had fallen utterly to pieces. Co-operation counted for nothing. Most of the members regarded it as a solution to their housing difficulties and no more. Worse still, enormous debts had piled up, and the person left in charge had bolted. Only one course was left to Cheshire; he must break up V.I.P. and somehow contrive to pay off the debts to tradespeople, and return what he could of the men's savings. And this, in time, he managed to do.

His next project has been a complete success. Today the house in Hampshire is a private nursing home—in name; in fact, it is a home for the aged, the incurably ill, the convalescent and those for whom life in the outside world has no place. He started it, and for some months he was the only "nurse," tending with inexpert knowledge but infinite understanding and care, the earliest patients—one dying of cancer, another far advanced with tuberculosis—two old ladies of over ninety. Through it all he moved with a sort of spiritual detachment. When I used to stay with him we talked about the practical issues, where the money was to come from, the lack of medical equipment, the increasing number of people who wanted to come, and, most urgent of all, his own limitations as a "nurse" in face of increasing responsibility. His attitude was: if you have faith, everything turns out all right, because real and unflinching faith in a greater Power reveals a purpose in life, a reason in its ways. His religion was beginning to dominate all his actions, and he spent much time in contemplation upon its ways, and his own spiritual needs. Not without long weeks of thought, and more weeks of preparation, did he make his final decision to become a Roman Catholic.

His faith in the Nursing Home—that is not the right description, but as such it is registered officially—was rewarded. Well-wishers provided much that was needed; the Red Cross supported it; beds, equipment, linen and practical gifts of furniture poured in. And so did the patients. Today more than thirty of them live a family life. Few of them are so ill that they cannot do something to help the other chap; for those who are incurably ill, no more beautiful surroundings could be found for the last months than the house on the hill, commanding the finest views in Hampshire. Most patients have jobs about the house or garden.

As I write, Cheshire is in France, resting at a quiet retreat. Earlier in the year his health again caused anxiety, and he will have to take life easily for some time. His work will continue, for he had the wisdom to draw together a team of trained nurses, under a Matron and Administrator, who will ensure continuity and efficiency. His own ideals still dominate the Home.

War does strange, unexpected things to many of us. I have tried to show what it did to Leonard Cheshire. His service to his country, and what his leadership meant to his generation, cannot be computed in terms of medals. He rose magnificently to the occasion of war as all Britain did. But his service to his people did not end with the possibility of spectacular achievement and glory, and in that, I think, rests an example we can all afford to remember when the temptation to rest on our oars is with us.

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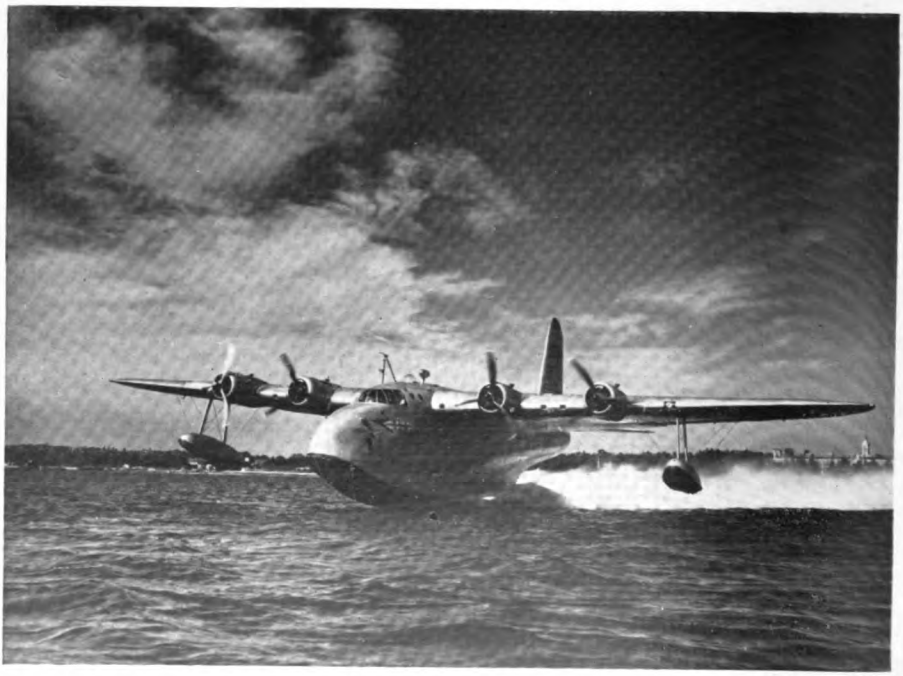
[Air Ministry Photo

A Sunderland Flying Boat over a convoy at dusk. Sunderlands were Coastal Command's chief U-Boat killers in World War II



[B.O.A.C. Photo

A fine action picture of "Pembroke," one of B.O.A.C.'s Plymouth Class flying boats, taking-off. Developed from the military Sunderland, which was itself developed from the civil Empire boats

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WE CAN'T AFFORD TO MISS THE 'BOAT

By John W. R. Taylor

WHEN Imperial Airways ordered a brand-new fleet of twenty-eight Short S-23 flying boats in 1935, to be used exclusively on all their Empire routes, C. G. Grey wrote in *The Aeroplane*: "Our Empire flying boats are collectively the biggest and boldest experiment, one might almost call it gamble, that has ever been taken in connection with British Civil Aviation."

It was certainly an unprecedented step, for the order was placed while the prototype was still on the drawing-board, despite the fact that no airline had ever before tried to operate a world-wide network of routes solely with marine aircraft. Nor were the Empire 'boats of orthodox design; on the contrary, they were monoplanes with finely streamlined, spacious hulls, offering completely new standards of passenger comfort, in an era of "birdcage" biplanes.

Foreign airline operators rubbed their hands with glee at the prospects of the elimination of British competition, but, as we know now, Imperial's "gamble" was destined to pay handsome dividends. The twenty-eight original 'boats, together with others of similar type ordered later, established our Empire air routes, operated the cheapest air-mail services in history, pioneered commercial flying across the Atlantic, and went on to serve Britain well in the Second World War. Between them, they flew a total of well over 20,000,000 miles, proving outstandingly reliable, safe and popular.

Fortunately, the Air Ministry was quick to realize the military possibilities of the design, and Shorts were asked to produce a long-range patrol-bomber version of the Empire 'boat. The result was the famous Sunderland, which, more than any other aircraft, helped us to survive the German U-boat menace in the Second World War.

In this, history repeated itself, for the "F" class flying boats which rendered such outstanding service with the R.N.A.S. in the First World War a quarter of a century earlier, had also been based on a civil design. They were developed from the big multi-engined machine designed in 1914 by the American Glenn Curtiss and our own John Porte to attempt the first air crossing of the North Atlantic.

Throughout the years which followed that war almost all of the fine flying boats built in this country existed in both civil and military forms, the civil type usually appearing first. With little money available for developing entirely new designs, the Air Ministry was only too pleased to share expenses with our airline operators, a course which was more than justified by the achievements of the Sunderlands and its predecessors.

Nor was the Air Ministry the only one to benefit from this close association. In the case of the Sunderland, for example, the development process completed a full cycle after 1943, for considerable numbers of these aircraft were modified and later redesigned to produce a whole series of civil 'boats, including the Hythe, Sandringham and Solent classes, which proved mainstays of our post-war civil aviation.

Two important facts emerge, therefore, from our past experiences in war and peace. Firstly, the flying boat has proved itself to be one of the most effective and important anti-submarine weapons available. Secondly, the development of successful types of military 'boat is inextricably bound up with the development of efficient civil 'boats.

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The present state of Britain's flying-boat industry, as a result of B.O.A.C.'s decision to suspend flying-boat services, is thus an extremely serious one. It could mean that in any future war, in which submarines would undoubtedly again constitute a major threat to this country, we might not have available sufficient flying boats of the right quality to help overcome the menace, for it is unlikely that the Air Ministry will be able to afford to develop a series of military flying boats which have no civil applications.

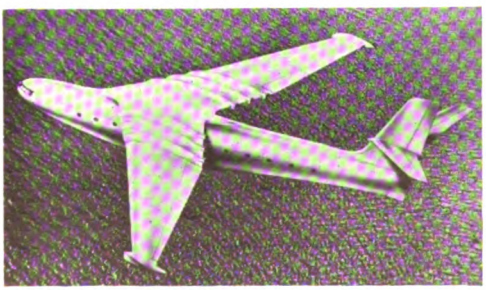
The tragedy of the whole thing is that there has never been any doubt of the travellers' preference for flying boats, and B.O.A.C. admit that they are turning over to landplanes solely for economical reasons. They claim, for example, that as they have been for some time the only major world airline using flying boats, they have had to meet all the high costs of maintaining marine bases along their routes, while other airlines get away with paying only relatively small aerodrome landing fees for their landplanes.

Unfortunately, much of the blame for these high costs must be laid at B.O.A.C.'s own door, for they insist on having passenger and fire tenders, complete with uniformed attendants, at their bases, quite apart from such things as expensive rest-houses, sometimes reached by roads specially hacked through the jungle, and equipped with "all mod. con."

As an example of what can be done to cut costs, with no detriment to passenger comfort, the writer recently made the most delightful and comfortable journey of his life to Madeira and back aboard an ex-B.O.A.C. Hythe flying boat operated by the privately run Aquila Airways, whose "marine bases" at Funchal and Lisbon each consist of one buoy and nothing more! Passengers were disembarked aboard launches owned by local boatmen, who, like the Company's agents, busied themselves on other work between times, so keeping costs to an absolute minimum. Such a state of affairs certainly caused no inconvenience to passengers and, if anything, added a welcome touch of local colour to the whole business.

Another argument put forward by opponents of the civil flying boat is that, compared with landplanes, flying boats are slow and uneconomical, which they prove by comparing a flying boat whose basic design dates from 1935 with a landplane designed in 1943! If one compares the Solent with a contemporary landplane of similar specification, or the Saunders-Roe Princess 'boat with the Brabazon, one gets a very different picture.

Looking farther ahead to the recently announced Duchess jet-propelled flying boat, one sees a machine able to fly at least 10 m.p.h. faster than the fastest landplane air liner ever built, carrying twice as many passengers at a cost of only one penny per passenger mile.



[Photo: Saunders-Roe, Ltd.

A model of the Saunders-Roe Duchess, designed to cruise at 500 m.p.h. with 74 passengers. The possibilities of a military version of this boat are enormous

Unfortunately, it is by no means certain that the Duchess will ever see the light of day, though Tasman Empire Airways are considering it for use on their trans-Tasman route, which passes through 1,300 miles of the worst flying weather in the world. B.O.A.C. have so far shown little interest in this aircraft, which

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could do more than any other to restore the prestige of British civil aviation *and* save the taxpayer millions of pounds a year.

The immense possibilities of a propeller-turbine powered military version of the Duchess are almost too obvious to need pointing out here. Such an aircraft would have an endurance of many hours for patrol duties, during which its relatively high speed would enable it to search a very wide area of sea. It could carry a heavy load of radar equipment for submarine hunting, plus an extremely formidable array of rockets, bombs, sono-buoys, mines, depth charges, guns or homing torpedoes to annihilate any submarine unfortunate enough to be detected.

It would be relatively independent of bases. Certainly its "runways" could not be put out of action by enemy attack; neither would they begin to crumble after a period of years as many airfields built in war-time are now doing, some of them vital links in our chain of Empire civil air routes or defence bases. Furthermore, pre-war experience proved that flying-boat crews can live aboard their aircraft for several weeks if necessary, supplied by a single depot ship.

It is to the credit of the Air Ministry that they have not overlooked the lessons learned in two world wars, and they are known to be considering the development of a gas turbine-powered military flying boat to replace the veteran Sunderland. But the whole business would be so much simpler and cheaper if B.O.A.C. would revert to flying boats, so that the two types could be built on parallel assembly lines, using many similar components. Meanwhile, Coastal Command is still equipped with Sunderlands, good aircraft but designed no less than fifteen years ago and not capable of applying all the latest techniques of anti-submarine warfare.

Britain's flying boats have established an unrivalled tradition of safety and comfort in peace and high achievement in war. In the face of such a record the present low state of our flying-boat industry is both deplorable and dangerous, for in these days of lively commercial competition and the ever-present threat of the submarine, we just cannot afford to miss the 'boat.

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[*Air Ministry Photo*

Passing-out parade, the correct version

[*Air Ministry Photo*

Hearing a practice charge. "Do you wish the evidence to be taken on oath?"

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"OFFICER CADET FLIGHT: ON PARADE"

BY FLYING OFFICER FRANCES ELIZABETH TATE, B.A.

THE student officer arrives at the W.R.A.F. Depot at Hawkinge prepared, with undue resolution perhaps, for anything. She has done her best to acquire the proper uniform—and strangely diverse are the results of these endeavours. She may even have come primed with the names and appointments of the members of the Air Council.

The first stage may be one of some apprehension, even bewilderment. The etiquette, customs and organization of the R.A.F. are entirely new to one who has entered by direct entry and not from the ranks. The earliest and not the smallest part of her initiation consists in learning to give and return salutes, appropriately and without shuffling bashfully by with eyes averted. Much, very much, can be learnt from the cadet course, running six weeks in advance of her own.

Another guide, philosopher and friend is to be found in the drill sergeant. "Get those arms up! Dig those heels in, ma'am!" he cries; and "Oh, ma'am!" he says, "you mustn't speak of *Cranwell* like that. Like this—." And "Flight will advance, left turn, stand at ease—see those three aircraft? There they go—see them? Now those are Vampires."

Considering that this is the Air Force she has joined, the aspiring officer is a little bit disappointed to find that there are no aeroplanes. Very occasionally one may land, and then there is much standing on chairs and craning of necks out of windows. Rumour has it that when the visit to R.A.F., Manston, takes place, everyone will be given a flight; meanwhile, their files soon grow fat and fatter with précis of lectures. The escapist who, when day is done, tucks herself up in bed and tries to read Wordsworth can hardly feel that her action is æsthetically fitting while her neighbours are saluting into their mirrors and practising about-turns in the corridor. Sadly she puts down the "Ode on the Intimations of Immortality" and reaches for the drill book. "Down to Earth" shall be her motto.

Very soon the season of little talks is upon her, and from the O.C.T.U. quarters of an evening there rises a strange, low humming sound. Walk down the corridor, and you will hear snatches of travel talks, fragmentary hints on how to cook, fitful revelations of the lives of historical characters. Do not conclude that the O.C.T.U. has so soon taken leave of its senses. Unaccustomed as she may be to public speaking, the student officer is going to make a speech in a set time, and a dozen or so would-be orators, with one eye on the clock and one on their notes, are having a dummy run. When the time for the ordeal comes, each knows that the class will accord her every appearance of rapt attention. But this, in a long silence, can become embarrassing. Her first care, therefore, is to make sure that she will never for one moment be left with nothing to say, and it is surprising what wealth of information can be imparted in ten garrulous minutes. The instructing officers bear it very well, considering how much of this they see and hear.

Not only the long-rehearsed, but the unexpected also has its place in the daily round. Papers are drawn from hats with horrid frequency, and the aspirant to a commission will find herself called upon to talk of cabbages or kings, or to solve some W.R.A.F. problem, at two minutes' notice and at the behest of chance; or she may find herself leading a discussion, or conducting a mock Mess Committee meeting, quite involuntarily. The unpredictability of it all reminds her of something—was it the blitz?

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For some days now the cadets have been going around hollow-cheeked and haggard. They have taken their final examination. Their fate hangs in the balance. They are figures of commiseration, awe, and—yes—envy. When the joyful news of their success is made known, a load is lifted from every mind, and moreover, it is seen that people do survive. Their passing-out parade proves it. "Did you see their marching? Now, you have got to be just as good as that. Tomorrow," says the sergeant, "we are really going to *work*."

It would be hard to say at what point precisely the student abandons the grub stage of apprehension for the cocoonery of increased confidence, but possibly the achievement of the course in advance of hers has something to do with the change. Borne up by the novel persuasion that the glory of her predecessors is not unattainable, as well as by a certain respectful motherliness towards the new cadet course—poor things—the direct entry amateur discovers she is enjoying life.

There comes the long-looked-for visit to a "real" R.A.F. station—Manston. Alas, no closer acquaintance with aeroplanes, unless you can count the earth-bound Brigand lurking in the hangar, and, of course, the Link Trainer in which one may experience a fast spin without dire consequences. Next day, there is more tempting of Providence by the method of lots. Everyone must give a two-minute account of any one section seen at Manston, the subject to be drawn from a hat. Impressions of parachutes, weather charts, flying control apparatus, are delivered with more or less accuracy but certainly with something less like stage fright. And even the new role of Flight Commander on parade is tackled with a sneaking gusto—everyone wants to be a devil and have a go, much as everyone wants to round the Horn in a sailing ship; only here everyone does it, and feels like Magellan himself.

The student is now deep in the mysteries of K.Rs. and M.A.F.L. Solemn mock scenes are staged between errant airwomen, charged with outrageous misdemeanours, and Section Commanders required to combine the wisdom of Solomon with the patience of Job.

"You have been thoroughly irresponsible, and I accord you fourteen days' C.C."

"You can't do that," says the voice of authority, "the most you can give is seven days. And this is a situation which could never have arisen, because . . ." and further light is thrown on unexpected intricacies of life in the W.R.A.F.

Making plenty of blunders still, the student is beginning to get the hang of it. Mistakes, she sees, are sometimes inevitable, and not always criminal. This is the philosophy with which she nerves herself to assume the duties of orderly officer for the first time.

Quite a lot, judged by the printed instructions, can happen. Should a foreign aircraft make an illegal landing, she must instruct the pilot to visit the guard room. She hopes her school French will be equal to it; and what if he has arrived with hostile intent? What if he pilots a troop-carrier laden with desperate characters? Prospects—any prospects—being less appalling than they were, she rather hopes that something so exciting will occur, so that she can manage somehow without handing it all over to the duty officer.

Meanwhile, the best she can do is to investigate complaints, if any, in the Airmen's Mess, to sign an incoming signal which is discovered in P.B.X., to electrify the sabbath atmosphere in the guard room by reporting a chimney on fire. Bells ring, people hurry to and fro, and a general sense of anti-climax prevails when it is found that the chimney in question is no longer throwing out showers of sparks. Well, she did her best. Everyone had five minutes' fun, and so to bed.

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[*Air Ministry Photo*

A passing-out parade, hangar version. Left to right: Air Vice-Marshal P. E. Maitland, C.B., M.V.O., A.F.C., Flying Officer Johnston and Pilot Officer Moore

Time is flying. Easter leave comes along, and with it the occasion to touch lightly upon the hardships and the hazards of her calling, for the benefit of inquiring relatives. "It seems to agree with you," they observe, unimpressed.

She now enters on a secondary phase of anxiety, for the final examination is imminent and can be pooh-poohed no longer. Oh, how she wishes she had not left that point—and that—and that—to be more closely examined at a later date! How exactly does one convert a fork, gardening, into a fork, toasting; how does one make sure that someone else pays the loss or damage on one's deficiencies; how does one determine who is and who is not on the effective strength of one's station? For every one of these feats of ingenuity can be performed if only one knows the right way about it. Conversation in the Mess consists of riddle-me-ree with a dozen competing solutions, and the distraught seeker after knowledge goes out by the same door where in she went, to take refuge in the absolute last-wordism of K.Rs. In vain. Nothing that she really knows is asked of her, and she begins to cultivate a curious, dreary satisfaction in the conviction that, anyway, her papers must have been masterpieces of despairing improvisation.

Harrowing post-mortems are now the procedure in the Mess. Long faces, stiff upper lips become the order of the day. The powers that be remain inscrutable. How long can it go on? How long did the cadets have to wait before they knew? Nobody can remember.

Frightful stories of past failure are bandied about: ". . . and nobody ever saw her again."

It is the method of disposal which so morbidly engages the fancy. "My dear, it's obvious—she was sent home in a kit-bag."

Hollow laughter.

Agony prolonged is evidently stupefying, for suddenly to hear that she has passed, that everyone has passed, is not more than merely surprising to the victim of her own imagination. Like an earthquake, it happened, that's all. The significance of it can be appreciated gradually. Not too gradually, one does not want to be retiring from the Service still oblivious of one's destiny—but in our present

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state of health, let us have no cataclysms. Let us pay delightful educational visits to Canterbury Cathedral and the Houses of Parliament, and let us lend an attentive ear to some few further lectures, in a spirit of decorous, but light-hearted participation. It would be misleading to suggest that the cocoon has now become a butterfly, for that is very far from being the object of her course, but there is little doubt that for the next few days, she takes her transformation lightly.

If you come to Hawkinge on an O.C.T.U. course in a mid-winter blizzard you will leave when the flowering cherry is in bloom, which is a pretty way of not saying that such a deluge may be in progress that your passing-out parade takes place in the hangar. That means that it will be rather crowded and very noisy. But, as Sergeant says, "Officers must have nerves of steel," and so nobody must jump when the band starts up, nor attempt a right dress on the order "right turn." And nobody does. No one, indeed, would have the hardihood in the presence of the Director of the W.R.A.F., the Director of the United States Women's Air Force, the A.O.C., the Station Commander, the officers, the guests, and the entire station including the cadets who must be encouraged, so to disgrace herself and her training. There ought to be something to show for thirteen weeks' endeavour on the part of both instructors and students, and the Officer Cadet Flight passing out modestly hopes that there is.

The new officer's life has been a busy one, from that moment long ago when she started knitting the scarf she was not going to need, to the morning when, honoured with the King's Commission, and railway warrant in hand, she proceeds on end-of-course leave as a member of the W.R.A.F. Incidental misgivings apart, it has been a happy one—there has been much cheerful company and one may truthfully say there have been few dull moments. She has discovered potentialities, if only faint and few, which she did not suspect in herself. Much remains to learn, but the first step has been achieved in a progress worth making.

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TRANS-POLAR WAR

By J. M. Spaight, C.B., C.B.E.

FUTURISTIC PLANNING

IT is a common complaint against strategical planners that they prepare for the last war instead of a new one. There is, however, another failing to which they are sometimes prone, and that is to plan for a new war, indeed, but one which will come about only *after* the next war has been fought and won or lost. They look too far ahead. It is a mistake to think that the next war will necessarily be entirely different from the last. There are always likely to be some residual strands of the old one left to make up the texture of the new, and they may figure prominently in its pattern, old-fashioned though they may appear. Because a particular danger was encountered and surmounted—for the time being—in the former war, we are inclined to write it off as a serious menace in the next one. We did so in the matter of the submarine menace in the period between the two world wars.

No one worried very much about submarines then. They had been mastered by the end of the First World War and were unlikely to give much trouble in a new war. The danger would be that from the air, not from the sub-surface of the sea. To talk about the latter was to show that one was out of date and had failed to move with the times. Not anti-submarine but anti-aircraft defence was the all-absorbing topic of the day. That was natural enough for land dwellers, but we lost our sense of proportion and forgot that if the U-boats did not blow us to bits, as the bombers might, they could starve us to death. We should have been dead in either event.

So today we are obsessed with the idea of the atomic bomb and do not think about the submarine; yet the latter may be the greater menace of the two. The fact that it was a grave menace in the two former wars does not warrant a comfortable belief that it will not be one again in a third.

THE RUSSIAN MENACE

On land, too, we should not be in a hurry to dismiss the dangers of the past. The old footslogging war is not yet dead. It is likely, on the contrary, to get a new lease of life just because the country most to be feared as an aggressor is the one whose army is the largest in the world. It is in many respects an old-style army. Despite its armoured formations and modern equipment it is essentially an army of infantry. It is the old Asiatic horde with some western trimmings. Russia is not at all likely to be able to wage against the United States the kind of futuristic war which some American commentators have warned their countrymen that the next one is going to be. The war which they foresee is one predominantly waged by bombing aircraft, and the objectives of the Russian attacks would be the great centres of population in the United States.

The distances have been calculated for this purpose with almost absurd exactitude. From Murmansk it would be 4,318 miles to Seattle, 4,216 to Chicago, 4,950 to Washington, and so on. Whether Russia has aircraft able to fly so far is also debated; she would if her Tupolev bomber, copied from the American B-29, were boosted up from 4,000 to 5,000 miles' range.[1] The route taken would be that over the Polar regions, that being the shortest from point to point. Arctic

[1] See article by R. Saunders in *Flying*, December, 1949.

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flying would present no very great technical difficulties. The missions would be of the "no return" order, but that would not rule them out.

THE TILTED GLOBE

The picture of a new world of the air age in which the centre of the chart is the North Pole and the hemisphere that is displayed is not the familiar eastern or western, as the case may be, but that part of both which makes up the northern half of the round earth, is one which seems to have caught the imagination of many American publicists. The subject has been dealt with from the point of view of civil aviation by Mr. J. C. Cooper in his book, *The Right to Fly*. Some of the series of charts which he gives to illustrate his argument have a strategical interest. Chart 3, for instance, shows at the centre the important Russian air base for east Siberia, Anadyr, near the Bering Strait. A 5,000-mile circle from this centre would take in all the United States, and a 4,000-mile one would embrace Chicago, Seattle, San Francisco and other cities in the northern United States. In Chart 5, Dickson Island, at the mouth of the Yenesei River, on the Arctic Ocean, is the centre of another ring of circles. "From a base on Dickson Island, or in that general area," says Mr. Cooper, "aircraft with a range of 3,000 miles could reach most of Alaska, with a range of 4,500 miles all of Canada and the northern portion of the United States, including Seattle, Chicago and New York. A range of 5,000 miles includes all of the United States north of Los Angeles on the Pacific and Charleston (South Carolina) on the Atlantic."[2] Conversely, with Fairbanks, in Alaska, as a base, aircraft with a range of 3,500 miles could reach all the north-easterly part of the Soviet Union from Archangel to the Mongolian frontier, including all the Soviet Arctic shore line. With a range of 5,000 miles, aircraft taking off in Alaska could reach almost any part of the Soviet Union, and, indeed, all Europe except southern Italy, southern Spain, Greece and Turkey.[3] Chart 12 in the book shows that the shortest route from Fairbanks to Moscow would be over the North Pole.

AMERICA FACES NORTH

Facts such as these have a direct bearing upon the strategical problems of the United States. While Japan and Germany were powerful and dangerous, the United States had perforce to keep watch to the west and to the east. Now the danger from those countries has passed, but another potential aggressor has appeared on the horizon: and the horizon is that which rings Chesterton's "ultimate icy floor," where "the other sea at the world's back cries through a closed door." The door is closed on the sea but not in the air. That is the quarter from which a blow might well come.

Major G. F. Eliot, the well-known military writer, gave one of the chapters of his book, *The Strength We Need*, the heading, "A New National Strategy: America Faces North." He wrote: "The shortest routes between the principal centres of Europe and Asia and the principal centres of North America lie across the northern part of the world. Facing Europe or Asia, in the sense of the new air strategy, America faces north."[4] That was written, however, before the North Atlantic Treaty was signed, and it may be that Major Eliot would add some qualification if he were dealing with the question now. Another well-known American commentator, Mr. Hanson W. Baldwin, Military Editor of the *New York Times*, has drawn attention to the need for reconsideration under the new alignment of the strategic outlook which made "the atomic bomb and the

[2] *The Right to Fly*, 1947, p. 208.
[3] *Ibid.*, p. 254.
[4] *The Strength We Need*, 1948, p. 130.

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long-range bomber a kind of Maginot Line in the American mind. To pound Russia into submission after she has overrun the west is no longer enough. We must check and defeat her onslaught on the west."[5] The fact is that America faces east still in so far as she has commitments in Europe. It is in Europe that a clash is most likely to come. The Far East cannot be disregarded, but the next war will begin in all probability in that continent of unrest in which the two former wars began.

THE POLAR CONCEPT

On that assumption, the need for a strategical plan of the revolutionary kind referred to above is not apparent. Why should the United States handicap herself by launching her strategic air offensive from bases at home and plotting it over the Arctic? What is wrong with Britain as a base? If Great Britain is considered too vulnerable now, if the re-creation there of a mighty bastion of American air strength such as arose in East Anglia in the Second World War is thought to be inadvisable in the new situation, what about Ulster? That part of the United Kingdom would be beyond the range of continental missiles. Ulster was crammed with American troops in 1942-45. It could take in plenty of American airmen in the next war, and find bases for their aircraft, too. Limavady stands where it did and it need not stand alone. Ulster could be for the United States Air Force what the Marianas were in the Second World War. It was from them that the raids were launched which broke Japan. American air power in the next war is going to be something stupendous (and heaven knows what it will be in the war after that); but why make its task unnecessarily difficult? Why make the "Polar Concept" the basis of a strategic policy to which there seems to be an obvious alternative?

The "Polar Concept" was expounded in the letterpress to an illustrative chart of the Arctic region which was inset in General Carl Spaatz's *Report* of 30th June, 1948.[6] Presumably with his authority it was pointed out that there are eight great industrial regions of sufficient productivity to be significant factors in a full-scale war. Their centres are Japan, central Siberia, the Ural Mountains, Moscow, the Don Basin, Western Europe, the British Isles, and the north-eastern United States. The shortest air route between the United States and the Urals is over the polar region. "Clearly, the whole cap of the world, from the thirtieth parallel to the North Pole, is the world of air power." Bombing aircraft, it was stated, were becoming available that would enable the United States Air Force to strike at most of the industrial complexes of the Eurasian continent. These were widely dispersed, whereas the main industrial strength of the United States was concentrated in the area enclosed by lines connecting the Connecticut Valley, Pittsburg, Chicago and Detroit. The United States' possession of the atomic bomb would be an important factor in the problem presented by the new concept.[7]

THE ACTUAL PROBLEM

It is well to look ahead, but is not this an example of looking too far ahead, of planning for conditions that will not be realities for years to come? The actual conditions of the next war are unlikely to afford the background for a strategy such as that contemplated above. The problem will be how to prevent an armed land mass from sweeping over Western Europe, and the air strategy that will

[5] H. W. Baldwin, "Strategy in Two Atomic Worlds," in *Foreign Affairs*, April, 1950, p. 391.

[6] *Report of the Chief of Staff of the United States Air Force to the Secretary of the Air Force*, Washington, 30th June, 1948.

[7] *Ibid.*, p. 107.

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help most to halt the invasion will be that of interdiction. The lines of communication of the armies of invasion will have to be assailed with everything that can be put into the air. There will be no bombs to spare for use against cities. Cities do not march, and smashing them will not necessarily stop the legions that do. It may be different in the war *after* the next. Then, there may be no great armies on the move. The air may be everything, the air and new and unimagined instruments which move through it, rockets to which the V2 was but as an infants' toy, guided missiles that can take oceans in their stride, air-borne robots with electronic brains and murder in their atomic hearts. Interdiction will not be the answer to the problem that will have to be solved then. The prime task will be to eliminate the enemy's capacity for utilizing the air space for the purposes of his aggression.

OBJECTIVES IN THE WAR AFTER NEXT

Even in the next war one may expect the enemy's air bases and factories building airframes and aero-engines to be objectives of high priority for the western bombers. In the war after next they will be still higher on the list, together with any launching sites from which rockets and guided missiles might menace the west. Plants turning out A-bombs or H-bombs or whatever new-fangled horror of the kind is then in use would also be obvious targets. Possibly, if the United States and the Soviet Union were the participants in that future conflict, the war would take on the shape of which the planners of an Arctic strategy dream. One may safely assume that there will then be in operation aircraft with radii of action immensely greater than those which we know today. North Pole vaulting may be a commonplace then, as Atlantic crossing is now. The global bomber on which the American airmen pin their faith may have become the reality which it cannot be said to be as yet. Jet bombers which will put the B-36 in the shade may fill the bill, yet one wonders whether then it will not be for the United States a mistake to cherish "the notion of painless victory after a ten-day atomic blitz launched from secure bases here in our homeland."[8]

Meanwhile, we in this country would do well to give heed to the wise counsel, of like tenor, which Air Chief Marshal Sir John Slessor gave at the Royal Academy Banquet on 27th April, 1950. "Nothing," he said, "could be more dangerous than to imagine that there was any short cut to security via the atomic weapon alone. The nations of the west must build up and were building up their conventional defences in the air, on land and at sea." They are keeping, we may assume, the conventional maps, too. The world may be going to tilt but it has not done so yet. Sufficient unto the day is the shape of the globe which we know. One cannot tell yet what is going to happen to the poor planet in, say, fifty years, when the scientists have done their worst with it. One thing we do know, and it is good to know. Whether the war the United States is thinking of is the next one or the war after that, there is no doubt whatever, if she is in it, who will win it. The issue will be as certain as that of the last war was from 7th December, 1941, onwards—which is no reason for our sitting back and just keeping our thumbs crossed. We and our continental allies have our parts to play, too. The war potential of the United States may be immensely greater than Russia's—and it is that which crushes the life out of an enemy in the end—but in the first clash of arms there may be situations of grave peril which the European members of the Atlantic alliance will have to meet as best they can. They will have to hold out until it is possible for the United States, as General Omar Bradley has said, "to funnel the great strength of our new world to the ramparts of the old."

[8] W. H. Hessler, *Operation Survival*, 1949, p. 104.

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IDEOLOGICAL WAR

By Wing Commander Andrew Combe, A.F.C.

THERE is a story about the uneasy period of tension of autumn, 1939. A lone sergeant was on special duty in Europe. One day he got a telegram: "War declared. Arrest all enemy." A few days later a Whitehall office received his reply: "Have arrested three French, a Turk, two Germans, a Czech and a Chinaman. Who is the enemy?"

However improbable the tale, it has an excellent point. Had the director of the Skoda works in Prague, who wrote to his bankers in Paris in early 1948, appreciated the point of that story, things might have been different for his country. "All is well in Czechoslovakia," he stated, "we have democracy, and the wheels of industry are turning again." Three weeks later the Skoda directors were in gaol, and the Communists in power. "My father was blind," says his daughter in telling the story. "He did not realize that we have moved from an industrial-political age into an age of ideologies. He failed to recognize the enemy."

Who is the enemy? A few years back it was obviously Nazism. Today an increasing number of people think it is Communism. The surprising thing is that it may be you or me!

To understand this startling statement we need to examine history. A British diplomat, for three years with United Nations and now in the Foreign Office, was talking recently to a group of serving officers. "Boiled down to its simplest terms," he said, "you can say that the Boer War was Imperialist. What mattered most was who should govern whom. The First World War had a different character; it was basically economic. The issue was who should own what. But the Second World War went deeper still. Instead of a clash of interests it became at root a clash of ideas."

He developed this theme by pointing to the peace conferences. The issues facing statesmen at Washington in 1921 were largely frontiers and finance. One nation wanted more territory, another reparations. In either case it was possible to bargain, to compromise. A state of peace was agreed when the interests were satisfied. But since 1945 the issue has been different. Mankind has been stirred to ponder its fundamental beliefs, its faiths. Nazism has put forward ideas which are unacceptable to the rest of the western world. There can be no peace as long as Nazi ideas are on the march. On this point no bargain is possible. You either agree or you disagree. So we have reached a clash in root ideas. And five years after the end of war, peace is still eluding us.

Only the statesmen who see and understand this ideological age, and are themselves equipped with an adequate ideology, have the power to change the course of history for the better. The ideological age has arrived. The task for us is to face and answer the challenge.

And as we face it, let us remember the other distinctive feature of the times we live in. Gone is our island isolation. Aircraft bring Cairo within five hours' reach from London. Radio girdles the globe in a couple of seconds. Gandhi's death was known to millions within minutes. So were the British election results! And changes in production methods give industry the chance to meet the world's needs as never before. The central theme is speed—speed in spreading ideas as well as speed in travel and production.

How should an airman respond to this challenge? That is the question facing

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us now. And most of us are not only airmen, paid by our nation to render it secure; we are citizens, taxpayers, husbands and fathers, too. Speaking for myself as a father of four, I am deeply interested in the future, since that is where we intend to spend the rest of our lives! But scanning the newspapers and reading of crisis, my mind grows numb. We have lived in crisis so long that crisis has become a habit. One temptation is to try to escape, to run away, to shut ourselves off, not to care. Another is to busy ourselves frantically with secondary things, so that there isn't time to think of the primary. For me the garden, the workshop and television sometimes take the form of caves in which I seek to retire! My attitude then is a symptom of ideological disease.

Some people do not like the word ideology. Some people don't like onions! Yet whether you like them or not, onions and ideology are found all over the world. Disliking them won't make them vanish. Our wisest course is surely to face the fact of their existence and include them on our menu.

Field-Marshal Smuts, when installed as Chancellor of Cambridge University in 1948, summed the situation up in a solemn warning—"There is abroad in the world today," he said, "a new technique of conquest without war—by ideological penetration." And he pointed to the way Czechoslovakia, a prospering democracy longing for peace, had been conquered by ideological penetration without the loss of a single life. For thirty years now there have been intelligent, able men ceaselessly plotting to gain control of the world through the power of ideas. They have developed a new form of war—ideological war. And the object of all war, as Commander King-Hall pointed out in his lecture to the R.U.S.I. in October, 1948, on "The Defence of Democracy," is to change the will of the enemy. Ideological war changes the will of the enemy without resort to the use of arms.

What, then, is an ideology?

In 1942 General Marshall toured the North African battle-front. He spoke to many G.Is. in the firing line and asked them what they were fighting for. "Because my draft number came up. Because I was told to." These were the usual answers. But the Nazi soldiers, whose bullets these men were facing, knew exactly what they were fighting for, and were only too ready to tell. They had a passionate belief in a big idea, and Marshall knew his men needed something to match it. So he set up a new department in the U.S. Army. Its job was "orientation," training young Americans to know what they were fighting for, and—in the words of Oliver Cromwell—"to love what they knew." The Army drafted to this Orientation Corps the officers and men whose past experience best suited them to tackle this novel task.

Some of the Orientation Corps had been trained in Moral Rearmament. Fired by the challenge of history to produce that uniting spirit without which even the best-laid human plans seemed doomed to fail, they had devoted themselves to the ideological struggle. They had set out to build a force that would answer the onrush of materialism, that would guarantee the growth of human freedom. Experienced in fighting for industrial team work, they turned their hand now to making clear the nature of democracy. A few of them were posted to Eighth Air Force Headquarters, and many in the R.A.F. are familiar with the debt we owe them. They set an historic lead in building Anglo-American unity and team work.[1]

Out of their work has come a new definition of an ideology. Originally "the science of ideas," it has grown to mean, in modern usage, a more concrete and definite thing. An ideology, says the modern dictionary, is a "faith by which

[1]See Eighth Air Force Army Talks, February, 1945, and *R.A.F. Journal*, May, 1945.

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men live and for which they will die." But for use in relation to war we want a still clearer definition. An ideology, said the American officers as they gained experience in orientation, has three component parts; it has a philosophy (or body of close-knit and logically developed ideas), and a plan, and a passion. You can have a philosophy without a passion or a plan, and it cuts no ice; it is not an ideology. But add a plan for its development, imbue the heart of the philosopher with a passion to propagate it, and you have an ideology. This is the definition which I propose to use henceforward.

Try testing this definition on the ideologies that you know. For example, Hitler wrote *Mein Kampf* to expound Nazism. His philosophy, in simplest terms, was that Germany was the master race, and his plan was to conquer the world with that philosophy. The passion that drove him forward was the powerful force of hate.

What had Marx to offer? Appalled by the social injustice inflicted on millions by uncaring management in the nineteenth century, he developed in *Das Kapital* the philosophy of world revolution to set the workers free, to produce a new society from which class distinction had been eliminated. But his mind was filled with hate, and his only plan for those who disagreed with his ideas was to destroy them—that the rest might rule. Thus emerged a coherent ideology. The workers are to be the super class. The super class is to rule the world. And the passion which drives the ideas forward is hate.[2]

But hate is a negative force. It is destructive, not creative. Its strategy is always to divide and conquer. It gives power and control to a few, but its bedfellows greed and fear stalk behind it, and together they enslave the men who absorb them. Any man who subscribes to hate instantly forfeits his freedom. He is blinded and bound. An ideology engined by hate might conquer the world, but it can never unite humanity.

So we come to the question, what can?

Every man, woman and child on the earth has the right to expect certain basic things in life. These are freedom, security, an opportunity to follow his or her destiny in happiness, free from cause for fear. Everyone wants to have his rightful share in the wealth and pleasures of the world, to enjoy human culture, to be respected by his fellows as a unit of human society, to earn an honest return from honestly given endeavour. Any ideology which fails to provide for everyone reaching that goal must be false, and is to be discarded. Is democracy an ideology? Has it got what it takes to reach that goal?

That is the critical question for the western world today. For Communism is the outcome of the failure of our forebears to live an adequate ideology. And today democracy is under attack, and has lost a lot of ground. Speaking last March to London business men who were studying at the Royal Empire Society the part of management in an ideological age, a Philadelphia steel director made this telling point. "Five years ago," he said, "when the world war ended, nearly 90 per cent. of the world's population was fighting with the democracies. Now the figure is nearer 35 per cent. What is wrong with democracy? In business, if our sales fall off, we examine our product and check on our salesmen. We need to do this for democracy today." And he went on to describe how men who had decided to change their ways, to unite with their fellows, and to fight for what is right in industry instead of who is right, were solving problems that had baffled their nation's leaders.

[2]British Communist Secretary Harry Pollitt, speaking at the Communist rally at Harringay Arena early this year, said with deep feeling: "To be a Communist, you must learn to hate, hate, hate. . . ."

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Unless we put democracy right now, and show by our living what it means, the remaining free millions of the earth will turn to some other philosophy.

Not long ago I took part in some experimental training. Mixed crews of R.A.F. personnel, aircrew and groundcrew, commissioned and not, together studied the responsibilities of citizenship in this ideological age. Their conclusions were simple. Democracy is being attacked by alien ideologies, all of which spring from a common source—materialism. No war can be won on the defensive. So democracy, whose basis is spiritual, must get on the attack; and must spread throughout the world the spirit and moral standards to which it owes its existence. To do this it must work to an all-embracing creative plan, and it must be inspired with such a passionate caring for humanity that it builds unity above all divisions of class, politics, language, creed, and points of view. Democracy must become an inspired and inspiring ideology.

These conclusions were echoed by a special course of Army officers. They decided that training in ideological war should be top priority in all military training, that each man must learn for himself how to live out democracy, that official action is needed to institute this form of training, and that it might be suitably initiated by a mobile team of trained leaders who would visit units in rotation to pick out and train local leadership.

I have also observed growing interest in ideological training among the civil community. It springs from the work of Moral Rearmament. Typical subjects for lectures and study groups are: What is an ideology? How do ideologies fight? What are their strategy, tactics, and weapons? What is our own ideology? The answers to these and similar questions seem to be kindling a fire in the hearts of ordinary people. They change from passengers to patriots. Is this the "A.R.P." of the modern age? It seems to demonstrate the truth of what Mr. Paul Hoffman, Chief of America's European Recovery Programme, said recently in Europe. "Moral Rearmament," he stated, "is the ideological counterpart of the Marshall Plan."

How, then, do I find myself placed under these new conditions of ideological war? As a serving officer of the R.A.F., what are my responsibilities? The war of ideas seems to be everywhere, wherever I turn. What's to be done about it?

Now air power emerged from the Second World War as the dominant military weapon. Neither land nor sea battles can be won without it. So a new responsibility has fallen on military airmen to take the lead in developing the science of war. For a junior Service this is a novel role. But it is one of the changes of history.

Ideological war has brought another change. It goes behind the bomb and the man who aims it, behind the man who orders the raid, to the root ideas which grip the minds of his nation as a whole. So it is everyone's affair. So the R.A.F. can make a virtue of necessity by setting the lead in learning how to wage it.

And there is another aspect to consider. Everybody knows that a further large-scale war with arms will devastate much of the earth. What is the good to a would-be conqueror of desolate tracts of radio-active rubble? Far better to conquer "peacefully," by ideological penetration without resort to force. Far cheaper, too. Can it be that ideological war will outmode the use of arms?

Whether this is so or not, a third world war is already joined. We call it the cold war, but with the losses in China and elsewhere, democracy has already suffered a thousand million "casualties." If world conquest at this rate continues, air power may never be used as a military weapon again.

What is our role? We could never be content with a passive, "shop-window" part, when world destiny hangs in the balance. To create world peace we must

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win ideological victory. And that needs total mobilization. It is everybody's task. Victory will go to those who produce in time a dynamic uniting ideology which sets everybody free to do what's right. Here the Air Force can take the lead. Like the post-war Danish army, we can start by making our Service a "training ground for democratic citizenship and the moral backbone of the nation." And we can go on to lead and train the nation. And as we do so, a new pattern of society will emerge, to which every yearning nation will turn its face.

Lastly, there is no neutrality. For those who subscribe to democracy, to sit on the fence is to play the enemy's game. The aim of materialist ideology is to change the will of democracy. A "democrat" without a will is a man already conquered. We must either fight consciously for our democratic heritage or we are part of the enemy. A voluntary system fails when people fail to volunteer.

And with this knowledge comes, for those who rise to the challenge and join in the fight, the triumphant conviction that democracy is the God-given form of society, an inspired fight for a new world where everyone is free to do what is right; where the wealth and work of the world are available for all and exploited by none; where peace and prosperity are our servants and not our masters. This is a superior concept to that of any materialist ideology. And it gives us the chance today to join in the fight to put it on the march.

THE FLYING THRILL

What is the thrill of this flying game ?

It is the excitement when the throttles are pushed open and you feel yourself being hurtled over the ground, faster and faster, when you abandon yourself to the power of the engines, anticipating the time when you will become airborne. It is also the end of your patrol when, with the flarepath ahead, you begin your approach, see the familiar lights and know that over there—though you cannot see the buildings—is the place where you eat and sleep, where after the loneliness of the dark sky there are friendly faces, a bright fire, the smell of cooking. Sometimes it is, perhaps, the feeling of detachment and remoteness from the earth when you break into the full light of the moon above a woolly mattress of cloud. It is the chase, the mastery over the machine and over distance. It is a hundred other things dull and interesting, wearying and exhilarating. It is a "bind"; it is a joy.

—W. Thomas Cunningham (from "Jottings of a Night Fighter").

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[Official Norwegian Air Force Photo

A good illustration of the fact that forced landings are not desirable in the Royal Norwegian Air Force

Major-General H. J. Almar Riiser-Larsen, K.C.B., Commander of the Joint Naval and Army Air Arms from 1940 until 1944, when he assumed command of the newly formed Royal Norwegian Air Force

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KNOW YOUR ALLY!

THE ROYAL NORWEGIAN AIR FORCE

By Major O. T. Mehn-Andersen, D.F.C.

THE Royal Norwegian Air Force came into being as a separate and independent service in London in the autumn of 1944, at which time it was decided that the previous Army and Naval Air Arms should be joined together, under the leadership of Major-General Hjalmar Riiser-Larsen, K.C.B., C.B., who, with the rank of Rear-Admiral, had been in charge of the joint command of the two air arms since the spring of 1940.

The intention of this article is to give our comrades-in-arms of the Royal Air Force and Commonwealth Air Forces a brief outline of the origin, pre-war history, war accomplishments, post-war planning and organization and special problems of the R.N.A.F.

ORIGIN AND PRE-WAR HISTORY

Military flying in Norway dates back to the year 1912 when aircraft were used for the first time in an army manœuvre. But it was not for some years that aircraft were acquired for military purposes and organized into an Army and a Naval Air Arm.

Norway remained neutral during the First World War, and the two air arms had, therefore, no operational experience up to the time of the German assault on Norway in the Second World War. They had, however, gained a fair amount of flying experience and produced some very capable pilots. A number of pioneering flights to Spitzbergen, the Arctic Ocean and the North Polar region, notably those of Major-General Riiser-Larsen, were undertaken by the Naval Air Arm or by civilian expeditions manned with Naval Air Arm personnel. A graduate of the Naval Air Arm was Colonel Bernt Balchen, the well-known Antarctic explorer, now of the U.S.A.F. The first flight across the North Sea was undertaken in August, 1914, by Major Tryggve Gran, at that time a reserve officer of the Army Air Arm.

At the outbreak of the Second World War the Army Air Arm was equipped with a squadron of Gloster Gladiators, a few Caproni twin-engined light bombers, about thirty antiquated Fokkers and some Tiger Moths. The two latter types were built under licence in Norway. The Naval Air Arm had six Heinkel 115 torpedo-aircraft, and about twenty-five MF. 11, a Norwegian-designed and built biplane on floats, very similar in performance to the Swordfish. Both air arms had ordered newer types of aircraft, but the German invasion found few of these aircraft had arrived and fewer still had been assembled and taken into use. Thus the combined strength of the two air arms, both in numbers and in performance, was no match for the overwhelming strength of the Luftwaffe.

THE WAR IN NORWAY

When German aircraft appeared in the peaceful Norwegian skies in the early hours of 9th April, 1940, the Norwegian air arms were as ill-prepared for the onslaught as the rest of the country's armed forces, and the surprise was very nearly complete. On that very first day of the invasion the main base of the Army Air Arm at Kjeller, outside Oslo, and of the Naval Air Arm at Horten, on the

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Oslo Fjord, were captured almost intact with all stores and equipment. The air arms, having no dependable system of operational control and warning ceased to exist as organized units. The fight was carried on by separate detachments, hurriedly organized and operating their landplanes from frozen lakes and improvised airfields, and their seaplanes from secluded fjords. There were several daring exploits and many instances of individual courage, but it is probably true that the air effort never influenced the outcome of the campaign in Southern Norway. Air power, in the real meaning of the word, was to all intents and purposes non-existent.

When the campaign in Southern Norway closed, some of the aircraft were flown across the North Sea to Great Britain and others escaped to the northern part of the country, where they operated as a unit until Norway was evacuated by Allied and Norwegian forces in June, 1940.

THE WAR OUTSIDE NORWAY

The flying and technical personnel evacuated from Norway formed the nucleus of the reborn Norwegian air units. The two air arms were placed under joint command in 1941 and the task of building up their combined strength commenced at once. The training camp, "Little Norway," at Toronto, Canada, was opened in the autumn of 1940 and the first aircraft, ordered in the United States before the invasion, arrived shortly afterwards.

Coastal and Strike Squadrons

The first operational unit, 330 Squadron, equipped with single-engined Northrop float planes, was formed in Iceland on 25th April, 1941, and operated as part of R.A.F. Coastal Command. In the summer of 1942 the Squadron was transferred to Oban, in Scotland, and equipped with Sunderlands. At the end of 1942 the Squadron was stationed at Sullom Voe, in the Shetlands, where it operated till the end of the war in Europe. Throughout the war 330 Squadron flew some 1,700 operational sorties, was credited with two U-boats sunk, two probably sunk and seven damaged, eight enemy aircraft were damaged and the Squadron furthermore carried out twenty-two successful rescue flights.

333 Squadron, equipped with Catalinas, was formed in February, 1941, and stationed at Woodhaven, near Dundee. A Mosquito flight, operating from Leuchars, was added in 1943 and was later to become 334 Squadron.

The Catalina aircraft carried out some 250 operational sorties, during which four U-boats were attacked, one sunk and one badly damaged. The Catalinas furthermore undertook several secret missions to Norway of a highly exciting and dangerous nature.

The scoreboard of the Mosquito squadron shows that two U-boats were destroyed and two damaged, eighteen enemy aircraft were shot down, three probably destroyed and two damaged. In October, 1944, the Squadron was moved to Banff, in Northern Scotland, as part of the Banff Strike Wing. The Squadron shares with that Wing the credit for considerable successes against enemy shipping along the Norwegian and Danish shores.

Fighter Squadrons

Two fighter squadrons were formed, 331 in July, 1941, equipped with Hurricanes and later with Spitfires, and 332 in January, 1942, with Spitfires. Both squadrons began operating in the northern part of the British Isles, but were later moved to an airfield in Southern England. They stayed in the same wing

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till the end of the war and together they took part in the invasion of Normandy and the campaign in Western Europe, operating on a mobile basis as part of the 2nd T.A.F.

The squadrons won their greatest victory during the Dieppe raid in August, 1942, when fifteen enemy aircraft were shot down, five probably destroyed and fourteen damaged, against the loss of two Spitfires. In 1943, 331 was the highest scoring fighter squadron on the Air Ministry's list. At the end of the war in Europe these squadrons between them could claim 196 enemy aircraft shot down, 34½ probably destroyed and 123½ damaged.

Other Air Activity

The picture will not be complete without mentioning the Norwegian transport squadron which, equipped with American Lodestar aircraft, maintained a link between the Norwegian Government in London and its representatives in Stockholm, from the summer of 1941. Mention must also be made of the many Norwegian aircrew of different categories who served on British night-fighter, heavy and light bomber squadrons, and in the R.A.F. Transport Command.

POST-WAR ACTIVITY

When the war in Europe came to an end the R.N.A.F. could look back upon quite a respectable effort in view of its size and the fact of its virtual obliteration when the enemy overran Norway. The results were by no means cheaply accomplished. The young air force had suffered some heavy casualties, about 50 per cent. of its flying personnel—among them some of its finest and most promising officers—were never able to return to their native land.

On arrival in Norway in 1945 the R.N.A.F. was faced with a new and entirely different sort of problem, requiring another kind of courage and endurance, namely, that of rebuilding the peace-time air defences of the country in the light of war experience. To appreciate the magnitude and complexity of the task confronting the air force planners, many factors must be kept clearly in mind. Firstly, Norway had been impoverished and partly devastated by five years of occupation, therefore the work of getting the country back on its feet economically and rebuilding the devastated areas clearly had to take preference. Secondly, Norway had never had a peace-time air force in the modern sense of the word, and at the same time the R.N.A.F. had been almost completely dependent on the R.A.F. for all those varied and complicated behind-the-lines services which are needed to maintain a modern air force. The work had, therefore, to start from scratch. Thirdly and finally, the R.N.A.F. got its full share of those post-war problems common to all democratic air forces, notably, uncertainty as to the future and lack of man power due to extensive demobilization. The task was further complicated by the political situation in the world, necessitating a permanent and fairly high state of preparedness.

It is also worth mentioning that Norway does not lend itself easily to flying. The distance between its southern- and northernmost airfields is approximately equal to the distance from London to Gibraltar. The country is sparsely populated and of its area 75 per cent. is mountainous terrain, limiting the possibilities of airfield construction and the chances of successful forced landings. In addition to the general problems created by heavy snowfalls and exceptionally low temperatures, the northern part of the country is steeped in almost continuous darkness throughout the winter months. These hazards of nature are further aggravated by comparatively few radio aids to navigation.

Flying in Norway nevertheless has its rewards. A flight across a landscape of

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Lieutenant-General Bjarne Oen, C.B.E., who took over command of the R.N.A.F. in 1946

shining glaciers and snow-capped mountain peaks of fantastic shapes, interspersed with green valleys and deep blue, precipitous fjords, bathed in the soft light of the midnight sun, is a revelation of Nature's beauty and grandeur not easily forgotten.

The greatest assets in the hard task of rebuilding the R.N.A.F. along modern lines, apart from the obvious advantages of its independent status and the operational experience gained during the war, has been the fact that practically all its officers have spent the greater part of the war outside Norway and thus been able to keep abreast of developments, chiefly through close association with their opposite numbers in the R.A.F. The extensive programme of airfield construction carried out by the Germans during the occupation has, of course, been another asset of very great importance.

The R.N.A.F., or "Luftforsvaret" (The Air Defence), as it is called in Norway, is made up of two main components, the air force and the anti-aircraft artillery. In March, 1946, Lieutenant-General Bjarne Oen, C.B.E., took over command of the R.N.A.F. General Oen was C.-in-C. of the Army Air Arm before the two air arms were placed under joint command and was later in charge of a detachment carrying out secret missions to Norway, during which time the General himself visited Norway to organize resistance groups. The war-time C.-in-C. was shortly afterwards made Director-General of the Norwegian Air Lines.

The Headquarters of the R.N.A.F. is divided into an Air Staff and an Administrative Staff. The rest of the central administration comprises the Technical, Equipment, and Medical Branches, and separate inspections for Radar, Signals, Armament, Navigation, Photography, Air Observer Corps, M.T., etc.

The country is divided geographically into four Air Commands, corresponding to the Army and Navy Commands, each with operational and administrative responsibility within its area.

Flying and technical schools have been functioning since 1945. An Air Academy was opened in 1949 and a Staff College will be instituted later this year.

A special feature of the flying training worth mentioning is the winter exercises carried out each year from improvised bases on frozen lakes high up in the mountains. During these exercises aircraft, equipment and clothing are tried out in sub-zero temperatures and future flying personnel are given valuable insight into the special problems connected with winter operations. This year's exercises were attended by a number of R.A.F. cadets, a practice that—if it is continued—should give the R.A.F. experience in this type of operations. The costly lessons learned by the R.A.F. during the war in Norway in 1940 clearly show the necessity of such experience.

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On the operational side the emphasis is on fighter squadrons, which are gradually being equipped with Vampires. Other operational aircraft in current use are Spitfires, Mosquitoes and Catalinas, American Fairchilds and Harvards, and British Oxfords and Ansons are used for the training of flying personnel. Lodestar, Junkers 52, Norseman and Fieseler Storch are employed in transport and communication work.

An improvised control tower during winter exercises, R.N.A.F.

CONCLUSION

Almost five years have passed since Norway was liberated. During those years the R.A.F. has always been eager and willing to lend the R.N.A.F. a helping hand in innumerable ways, thus further extending the firm ties of comradeship and friendship established between our two air forces in times of war. We of the R.N.A.F. fully realize the debts of gratitude we owe our older brother across the North Sea and hope that the R.A.F. will continue to take an active interest in our progress. Nowadays we are, more than at any other time in history, all in the same boat. Regardless of their size, the air forces of the democratic nations depend upon each other for their common defence, and the days are long since past when the small air forces could be looked upon with only a sort of amiable and somewhat disinterested curiosity.

Due to Norway's limited economic resources and small industrial capacity the country will never be able to maintain a large air force. Furthermore, the R.N.A.F. will always have to contend with the obstacles nature has provided. The lessons learned in the past, and notably those of Malta and Burma, show, however, that numbers alone are not the only deciding factor in the air war and that numerical inferiority as well as nature's obstacles can be overcome by determined and resourceful leadership.

Since the liberation of Norway considerable progress has been made towards creating a modern and efficient air defence. No air force worthy of the name has ever been improvised in a short space of time. The R.N.A.F. still has a very long way to go, but, in spite of setbacks and obvious shortcomings, it looks confidently towards the day in the not too distant future when it will be prepared for its vital task as Norway's first line of defence.

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A demonstration of rescue of an aircrew by a naval helicopter

Practice rescue of a dummy pilot by a naval crash tender's crew

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LIFE IN A ROYAL NAVAL AIR STATION

By Rear-Admiral H. E. Horan, C.B., D.S.O.

TO many it must be a source of surprise to hear that the Royal Navy now has to have air stations within its jurisdiction. But when one looks at the importance the air arm has taken in naval warfare and the highly specialized training required, one sees at once the need of these establishments.

About one-third of the entire personnel in the Navy is now employed in naval aviation, and you will find naval air stations in England, Scotland and Northern Ireland. As everyone in the Navy must be borne on the books of a ship, these stations have all been given ships' names and so, when we find ourselves visiting the largest, we find ourselves "going aboard H.M.S. *Daedalus*."

This is the name by which the Royal Naval air station at Lee-on-the-Solent is known.

H.M.S. *Daedalus* consists of a depot and a naval air station, and these two establishments have two separate functions. The depot is responsible for the manning of the establishments and ships with the personnel required for flying duties in the Navy, and the air station carries out the normal duties which its counterpart in the Royal Air Force does, with the one exception that it accommodates the aircraft and crews when they are disembarked from the carriers. In fact, it is to the operational units what a submarine depot ship is to her submarines.

There is nothing like a ship in the appearance of H.M.S. *Daedalus*. As you enter the gates you see neat and tidy drives bordered with shrubs and flowers and, rising out of these, mellowed red brick buildings which form the barracks. These barracks are spacious and airy and have first-class accommodation for both officers and ratings. As they were built between the wars they compare most favourably with the other barracks at the naval depots of Portsmouth, Devonport and Chatham.

To the landsman it must sound funny to hear such phrases as "going ashore" or "catching a liberty boat," meaning, of course, leaving the barracks or falling-in to muster before going on leave. Generally speaking, naval terms are always used. It comes in very handy when the personnel are embarked.

The depot side of the organization is the same as at any other naval depot. The records of everyone in naval aviation are kept, drafting is carried out, and generally the welfare and advancement of all ratings are carefully gone into. This is a big business and it is surprising how few officers and ratings are employed on the job.

THE NAVAL AIR STATION

So much for the depot. Although in the same enclosure the naval air station is a separate command and comprises the usual hangars, store-sheds, repair shops, etc. which go to make up the necessities for any air station. There is one difference, however, and that is there is a slipway which the amphibians, inseparable from flying over the sea, can use.

The first thing that strikes a visitor is that the aircraft used by the Navy seem quite different to those employed by the Royal Air Force. This is because they are designed for work in ships where space is always scarce and have to land on the deck of the carriers where the runway is minute when compared to that on

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an airfield. To see the operation of landing-on aircraft in a carrier and "striking them down" is a most exciting experience and a revelation in drill and timing.

It is in this landing-on evolution that the first great difference between naval and any other kind of flying manifests itself. To anyone aloft in an aircraft, the carrier on which he has to land looks exactly like a postage stamp in an enormous dark green field and even when he gets near the ship the flying deck seems quite inadequate for his aircraft to pull up in. But so perfect is the drill nowadays that he finds himself on the deck and half-way down the lift before he has really grasped what is happening.

The store-sheds of a naval air station are a source of wonder. In them are stored 25,000 different items of stores in carefully arranged bins. The staff to look after this valuable gear is very small, but you can ask for anything from a pin to an aeroplane tyre and it is there ready for you to take away in less time than it takes to write this.

Perhaps the most interesting part of the whole installation are the repair shops. Here you can see highly skilled workmen carrying out every form of repair and replacement. What strikes one at once is the smooth efficiency with which every operation is carried out and the cleanliness and lack of noise are most marked. The meticulous way in which everything is done and checked impresses itself on the memory. It is quite clear that those who have to take the machines into the air can have every confidence that their craft are as near perfect as organization and skill can make them.

TRAINING AND OPERATION

So much for what may be termed the maintenance side of the station. Now let us look at the training and operational side.

There is one large hangar devoted to every form of training appliances. The ingenuity displayed in making all training realistic must be seen to be believed. The full drill of a flight from a carrier or shore station ending with the final attack on a target can be gone through from start to finish. Records are kept of what has actually taken place during the mock attack and are carefully analysed and discussed so that mistakes can be pointed out and lessons learned.

A W.R.N.S. radio mechanic servicing a naval aircraft's radio equipment

The climax of a torpedo attack is, of course, the actual final run in and the release of the torpedo. For this the pilot sits in a dummy aeroplane in the centre of a large bowl on which is projected a sea and sky scape and as a small spot the target. As the approach goes on so the target becomes more distinct and is made to carry out turns which in actual practice a ship might do if carrying out evading action. The timing of all this is, of course, the same as it

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would be for the real thing. Changes in light and visibility are introduced and a careful record is kept of the movements of the aircraft and the target. Finally, the pilot releases his torpedo and makes his get-away. To watch an attack taking place in fairly short visibility with the target silhouetted against a beautiful sunset is, to say the least of it, the height of realism.

THE AIRFIELD

The airfield is like all other airfields with the three tarmac runways set in a triangle. Of course, the first thing that strikes the eye is the control tower which is situated at the south-west corner. This is in four storeys and houses the duty aircrew quarters, the briefing room, the meteorological office and at the top the control officer's office.

The meteorological office is full of interest. Here you can see what the weather is doing all round the British Isles and far out into the Atlantic. Reports are constantly coming in and being plotted. This weather forecasting job is indeed a science, though not as yet an exact one. That it is of first-class importance to all who fly goes without saying, and only specially trained experts are employed on the job.

The way so many nations are co-operating in this most important service is most interesting to see. Generally speaking, the U.S.A. take the western part of the Atlantic, and the British, French, Norwegian and Spanish the eastern half. All these countries employ ships in their areas and there is no one who will envy them their jobs. These are the outposts, as it were, for the network of stations which exist on terra firma and, of course, are maintained by the nations in which they are situated. From the naval officer's point of view, weather is always of intense interest. Whether it be concerned with exercises or such mundane matters as regattas or painting ship, the reports from the naval air stations are always being asked for.

To a naval officer who has been at sea, not in the air arm, all his life the routine for bringing in an aircraft in thick weather is a source of wonder. To hear the control officer in the tower giving directions to an aircraft he can neither see nor hear, and, after a very short space of time to see that aircraft emerge out of the murk at the right height and on the right bearing for a perfect landing is a matter for wonder, to say the least of it.

FLEET REQUIREMENTS

Nowadays there is seldom, if ever, an exercise takes place at sea in which aircraft are not required. Whether it be for torpedo, bombing or fighter attacks, or the prosaic duties such as calibrating radar installations, towing targets for heavy artillery firings, working with the fighter direction ships, etc., these requirements must be promptly met.

A special organization known as the Fleet Requirements Unit deals with all these matters and it is quite true to say that their motto is "Never a dull moment." In addition to having to deal with our ships, they have also to do the same for our allies. Whenever U.S.A., French or Dutch ships are in the vicinity of our coasts, our aircraft are in constant demand and the co-operation is most satisfactory.

COMMUNICATION UNIT

The importance attached to naval aviation by the Navy is well shown by the number of flights undertaken at short notice all over the United Kingdom by both officers and ratings whose duties necessitate speedy transport. Also at short

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W.R.N.S. radio mechanics servicing naval aircraft

Maintenance personnel servicing radar on a naval Firefly aircraft

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notice craft may have to go to outlying naval stations, such as Malta or Gibraltar. These are all catered for by the Communication Unit, which is another hub of activity.

PERSONNEL

Enough has been said of the various activities which go on from day to day in H.M.S. *Daedalus*, and now comes the time to talk about the people who do all the work.

Being a naval establishment it is manned by naval personnel including, of course, members of the W.R.N.S. A few civilians do specialized work in the maintenance branch.

Following modern practice, specialization is considered essential, but there is one thing that impresses an observer and that is the keenness of all on their branch of the Service.

The routine followed is the same as for any shore station with the exception that when large-scale night and day exercises are in progress a twenty-four-hour service is maintained.

The part played by the W.R.N.S. is noteworthy. Except for really heavy jobs they work side by side with the naval ratings. Whether in the offices, stores or as members of the duty aircrew, they are always bright and cheerful. They excel when dealing with matters in the Signal Distributing Office, and man certain of the wireless installations where their quick wits and fingers come in very useful. Any naval establishment without a W.R.N.S. complement would be a dull place indeed.

RECREATION

Every form of recreation is catered for in H.M.S. *Daedalus*. Playing fields abound and organized team games keep everyone healthy and happy. The *esprit de corps* in naval aviation is first class and teams take part and do well in all Service and inter-Service sports. It is most interesting to see that teams are entered for the annual field-gun competition at the Royal Tournament, which is a form of sport peculiar to the Navy but which, of course, seems quite out of place in naval aviation!

Dances, sing-songs and theatricals are all encouraged, so that every taste is well looked after.

The motto throughout seems to be "Play hard and work hard," and this, surely, makes for happiness and contentment.

CONCLUSION

It is fair to say that the youngest branch of the Royal Navy is already living up to the traditions of that Service.

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U.S.A.F. Week. A break for coffee [Crown Copyright

Rowing. A Staff College four on the Thames at Reading [Crown Copyright

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LIFE AT THE R.A.F. STAFF COLLEGE

By Wing Commander A. G. Boycott

Officers' Mess,
R.A.F. Station,
Dimhampton.
1st *July*, 1950.

My Dear Charles,

Thanks for your letter of the 1st. I saw in A.M.Os. the other day that you had been selected for the next course at Bracknell, and since my time there is still fresh in my memory I will give you, as you have asked for them, a few ideas about the kind of life you may reasonably expect to lead there during the course.

You will get your joining instructions (and they are naturally a model of their kind) early in October, and the course, now a year in length, begins about halfway through the following January.

Just under a hundred students will arrive along with you and they represent a balanced cross-section of the various R.A.F. Branches, Army, Navy, Dominions and U.S.A.F. officers, and these latter each have a representative on the directing staff. The first day of arrival is given over to settling in, personally D.S. conducted tours of the buildings and introductions to the five or six other members of the sydnicate within which you will work during the first period of about two months.

The syndicate system is the basis of the instructional set-up. The syndicate works together with its own D.S. officer as guide, philosopher and friend, and further, the five or six syndicates are in turn linked together into groups, three in number and each supervised and controlled by a group director—a Group Captain. The detailed organization of the whole "layout" is carried out by the Director of Plans and his staff, whose job it is to produce the weekly time-tables, arrange the visits, lectures, demonstrations, etc. Thereafter on the second day, work begins at 0930 hours sharp with an address by the Commandant, followed by group and syndicate meetings, the checking of issued books and the completion of the first simple exercise, which is no more than a description of your Service and Service experience to date.

Except on Monday, when, for the convenience of some who live a considerable distance from the College, work begins at 1000 hours, the official day starts at 0930 hours and ends about 1900 hours, though whether it is always at late as this depends upon the programme. Since on occasions a busy man cannot get down to lecture till about five in the evening, this may make things run rather late. There is a break at 1030 hours, or later in the morning as may suit a lecturer's convenience. All students, once they are well into the course, find it necessary to do a considerable amount of study and exercise writing in their rooms after dinner. The programme through the weeks is highly diversified, and, as a rule, individual work on exercises, syndicate discussions on them, and lectures, either by D.S., visitors or students themselves (more of this latter hereafter) break up the time.

As at any university, the lecture system is the core of the instruction, no matter by whom given—D.S., outside experts or the students themselves. So far as it is possible to get hold of the outside experts, their talks, with those of the D.S., are phased into the programme so as to give the background knowledge to some

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topic or another that will form the main theme for an exercise; for instance, during a whole week the Scientific Adviser to the Air Ministry and his staff will be discussing the value to, and the uses made by, the R.A.F. of modern scientific and statistical methods. Lectures usually last about three-quarters of an hour, followed by a short break and then questions by the audience lead up to a general discussion, and then the Commandant or senior officer present finally sums up the important points. These discussions are invariably of great value and interest.

Next, perhaps, in importance to the lectures are the visits, either to R.A.F., Army or Navy establishments, a gunnery shoot at Larkhill or a day at sea on a carrier, House of Commons, a newspaper office, or longer visits of several days to such places as the Anti-Submarine School at Londonderry, etc. Visits are also paid to the College by various expert teams who, both by lecture and demonstration, illustrate the progress, mainly on the scientific side, that is going on in modern warfare; then again, we have a whole week given up to a joint R.A.F./ Navy show when the Greenwich Staff Course come here for a joint exercise. Or perhaps the high-light of these visits—the U.S.A.F. Week, which ends rather more boisterously than maybe it began. There are other visits too, not perhaps on so high an academic plane, but who can deny the value of Aintree or Twickenham? None the less, despite the efforts made to vary the programme, it is hard and concentrated work, and the completion of exercises in good shape and time makes heavy demands, especially on those (and this is true of most of us) to whom this type of training is unaccustomed.

Work on Wednesday is in the forenoon only and in the afternoon are games, organized or privately arranged as the case may be. Saturday is sacred to flying and private study, with emphasis on the private, and the week-ends are, believe me, well-earned and enjoyed the more because of it.

What then is the object of these activities? Your joining instructions define them in these words: "The Royal Air Force Staff College exists to afford an advanced Service education to selected officers, thereby fitting them for Command and Staff appointments appropriate to their present ranks and preparing them to fit themselves for higher appointments." Any consideration of this statement will show at once that there are two aims, one short-term and another long-term. In the first place, and on the short view, the Staff College exists to provide an annual and regular output of officers technically capable of filling the many Staff appointments that any modern and efficient force must possess; in the second and long-term, officers, hand-picked at an early stage in their career, are enabled to begin the process of fitting themselves for higher appointments which come naurally later on in their service. The difference between these two aims is obvious. In the one case, the Royal Air Force requires a steady flow of trained officers to do the daily Staff chores, and on the other hand, looking far ahead, it offers to those officers the opportunity to begin the long period of training and effort that high command requires. But there is more in these words than this. Today, in even greater measure than before the war, the R.A.F. Staff Officer must be fully equipped with the basic knowledge of the organization, administration and operation of his own Service and also that of the Army, the Navy and the U.S.A.F.; he must have a knowledge of strategy, of the principles of war, and the functions and roles of air power; he must have more than a nodding acquaintance with problems of personnel and of the weapons and tactics of the R.A.F. and the development of science as these today affect fighting efficiency. These are the things that a Staff Officer must know and these things, moreover, he can be taught. On the longer view, the aims are different. Here the Staff College aims to teach the student to achieve "not the accumulation of fact but the possession of a

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method"—the method of straightforward and logical thinking, argument and expression together with some understanding of the larger questions of national and international affairs which lie on the borderline of the higher direction of war where politics and strategy are practically indistinguishable.

So much for the aims. What of the methods? These are well tried and familiar and are in line with those methods which constitute the so English contribution to higher education. The system of self-education through doing, rather than formal teaching; the polishing of mental acuity through contacts both with fellow-students in the syndicate room and with the syndicate director. This system, moreover, has another great advantage in that it dispenses with the need for any form of passing-out examination, simply through the fact that any directing staff officer worth his salt can size up with uncanny accuracy the calibre of his students after a couple of months of intimate contact of the kind detailed above. And this further. Though a student remains in the same group during the entire course (it takes some time for the group director to get to know his thirty-odd students really well) he will spend his time in four different syndicates and under four different directing staff officers, so that by the end of things no less than five persons are able to make a highly exhaustive and accurate assessment of his character and ability and recommend the type of appointment for which he is held to be best suited, though even in this important matter every student has a chance of expressing a preference. And here it may be well to say that most chaps on arrival think that the Staff College is peopled by directing staff of slave-driving propensities. Nothing could be farther from the truth. The only slave-driving I saw was that of the D.S. by themselves.

But lest you should be regarding yourself as too much a passive agent in all of this you will find that you have got to make some direct and personal contribution. These take several forms. You may, if you happen to have some specialist knowledge or underwent some particular war-time experiences, be asked to speak on this *coram publico*—it is rather an ordeal, of course, but you will get all the help and guidance you ask for both in the preparation of the matter and in the techniques of its delivery. The drawing office will produce for you sketches or diagrams in first-class style. If, however, you do not fall into this rather specialized category, you will form one of a team who will lecture on some topic of current political or Service interest, but here again, every effort will be made to fit you into a team handling a place or a subject on which you may have acquired some first-hand information during your service. The Staff College sets considerable store by this public speaking business and you can, if you like, have a recording of yourself in full flight; the results, like being photographed, are sometimes surprising and often disconcerting. Another personal contribution is your thesis. It is hard work, but worth while. If the thesis is a good one, THE ROYAL AIR FORCE QUARTERLY may be after it and they will pay you handsomely for the right to use it! One may choose from a number of subjects of Service interest, or if you really feel you have some individual contribution to make you may choose your own subject. Provided your D.S. and group director agree, you can go ahead, selecting your own methods of approach and presentation and doing your own research in the College library or using outside sources (e.g., the Library of Chatham House, of which all students have been made honorary members for lecture and library purposes).

A small map as an appendix to your joining instructions will tell you that Ramslade House lies just off the main Ascot-Reading road. Here it is true there are no dreaming spires, but a small country town lying in the heart of the still almost unspoiled countryside. Ramslade itself was a country house turned in the

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A Brains Trust session with Donald McCulloch as question master

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Navy Week, 1949. An exercise (on the lighter side)

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late thirties into a number of dwellings by the addition of two wings of flats completed just before the war. Over all, both the accommodation and the service are very good: nowhere today are these things easy, but it would be true to say that the living-in officer is entirely relieved of any domestic worry that might interfere with his attention to the work in hand.

At an early date in the course you will be reminded that Service co-operation is not necessarily confined to the syndicate room but extends to every Staff College activity, such as playing games or taking part in the various social activities that crop up from time to time. In what is now almost a dormitory area and may well shortly become a satellite town, the opportunities for field sports are poor, but the ordinary games are many and varied and easy to come by. Mess subscriptions to two first-rate golf-courses are small and there is on the place the usual station sports ground and facilities. Opponents may be a little hard to come by, but this fact did not prevent a recent rugger side from gaining the distinction of going through the season with but a single victory! A quite passable nine-hole golf-course has recently been laid out round the playing fields. Thus, squash at a neighbouring country club and three tennis courts on the place give ample opportunities for quick and energetic exercise. Some, too, fall to the allurement of rowing on the Thames at Reading. Ascot race-course is conveniently near at hand.

You will be expected, of course, to fly as often as you can from the College flight at White Waltham.

On one Sunday every month the College is at home in the forenoon to ladies (children play in the gym.) and at the beginning of each course and at such odd times as circumstances give the occasion, ladies are welcomed at cocktail parties and twice a year the Staff College Ball gives an opportunity to entertain representatives of the other Services and distinguished guests. Dining-in comes once a month. At the beginning of each course, too, each group director and his staff throw a party at the "local," which serves the admirable purpose of breaking the ice and making all-round introductions within the group. You will see, thus, that the five days are well filled but good as week-ends are, some longer breather is called for. There are two breaks during the course. About a fortnight at Easter and a good month in the summer.

Last, but by no means least of the College social activities, is reserved for the final night of the course. By tradition C.A.S. honours the College by addressing it and taking dinner with it afterwards. Dinner over, and one can only imagine by way of showing how much they have benefited, the students stage their final exercise. "Clueless" it may be by title, but the author well uses "his folly like a stalking horse and under the presentation of that he shoots his wit." And so next day to a farewell address from the Commandant and (we hope!) the achievement of a p.s.a.

So ends a year which, if it has done no more than give temporary freedom from the tyranny of the machine and opened the way to the freedom of the intellect, has been worth while by reason of the friendships that it most certainly will have made.

Yours ever,

BILL.

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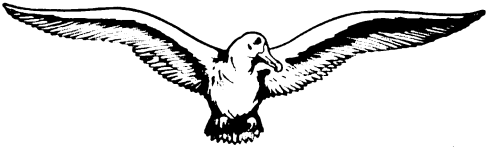
IS THIS AIR FORCE BIRD—

AN EAGLE—



OR AN ALBATROSS ?

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TRADITIONAL LEGENDS

IT seems appropriate that, at a time when old memories are stirred by the revival of the annual air display, we should make sure that the origin of symbols, now rather taken for granted, are not lost to posterity. How many are there today who can explain why the red, white and blue "roundel" and not the cross of St. George or the Union Jack was taken into use for identifying our military aircraft? What is that strange-looking bird that adorns the cap badges and buttons of No. 1 Service dress today? Is it an eagle or an albatross? How many know how their motto, "Per Ardua ad Astra," came to be adopted, or that the most renowned scholars in the land have declared that it is untranslatable into English?

It must have seemed odd to many that the curious, and now obsolete, "full dress head-dress" had several bald patches in the fur. They were *not* caused by moths, but had a significance relating to early aviation history. This was symbolic of the old "crash" helmet worn by such veteran flyers as Cody, with the fur ear pieces turned up and a few other fur decorations, plume, gold chain and badge added, and it became our first "head-dress."

THE ORIGIN OF "THE R.A.F. ROUNDEL"

When the earliest British aircraft first flew in war, they were without any national markings.

It was quickly discovered that "identification of aircraft" was not cultivated in the allied armies and that in consequence our aircraft were fired on by friend and foe with equal impartiality.

To make identification simple, a Union Jack in the form of a shield was painted beneath the lower planes of all British aircraft. In the early stages of the war when reconnaissances could be safely carried out at low altitudes, this reduced the odds considerably of being shot down by our own infantry, but as anti-aircraft improved, our aircraft were obliged to fly higher and then only the cross of the Union Jack was plainly visible, which might conceivably be mistaken for the Maltese Cross used on German aircraft.

In October, 1914, it was decided to adopt the more easily distinguishable three circles of red, white and blue, such as were used by the French; the difference between the two countries was preserved by the reversal of the order of the colours.

THE ORIGIN OF "PER ARDUA AD ASTRA" AS THE R.A.F. MOTTO

By chance, out of strange circumstances and after much controversy, this motto of no classical authorship or origin was born on 15th March, 1913, as the motto of the Royal Flying Corps and adopted by the Royal Air Force in 1918.

In 1912 Colonel Frederick Sykes, the first Commanding Officer of the Royal Flying Corps (Military Wing) asked his officers to suggest a motto for this newly formed flying service, which would foster *esprit de corps*. Soon afterwards, two subalterns, while walking from the Officers' Mess to Cody's shed on Laffan's Plain at Farnborough were discussing the problem of a suitable motto, and one (J. S. Yule) suggested the Virgilian "Sic ictur ad Astra," which, merely suggesting a journey to the stars, seemed lacking for the purpose and was rejected; then he proposed "Per ardua ad Astra"; this he interpreted as "Through Struggles to

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the Stars," and it seemed eminently suitable. Colonel Sykes thought so also and forwarded the suggestion to the War Office. After much controversy and after many other mottoes had been considered and rejected, it was submitted to the King, who finally approved its adoption.

But from where did this motto come?

At that time the very popular novel, *People of the Mist*, by Sir Henry Rider Haggard, was in the Officers' Mess at Aldershot, and in the first chapter Yule had read: "To his right were two stately gates of iron fantastically wrought, supported by stone pillars on whose summit stood griffins of black marble embracing coats of arms, and banners inscribed with the device 'Per ardua ad Astra.'"

But what of its origin? Did Sir Rider Haggard coin the words himself, or see them in some obscure book? Was it coincidence that this motto had been that of the Irish family of Mulvany for hundreds of years, who had always translated it as "Through Difficulties to the Skies"?

Its real origin remains as obscure as its authoritative translation. The most renowned scholars in the land, owing to the various meanings which could be placed on both "Ardua" and "Astra," have declared it to be untranslatable. To the Royal Air Force and the Commonwealth Air Forces it is likely to remain "Through Struggles to the Stars."

Little did Sir Henry Rider Haggard think when writing *People of the Mist* that the motto then used would in future generations always call to mind the bravest deeds of men and the traditions of a Service second to none, not only in this country, but all over the world. Anyway, the origin of this motto is not naval or military, be its translation "Onward and Upward" or "By Ordeal up to the Firmament of Heaven," or "Through Difficulties to the Skies" (or is it "stars?"), it is peculiarly our own and the deeds of our air forces have made it famous.

EAGLE OR ALBATROSS?

Rumour dies hard. Those old enough will remember the heated controversy over "the train loads of Russian soldiers that passed in the night through this country in 1914." How normally balanced men stated with emphatic assurance that they had seen them, those of more lively imagination adding "snow still visible on their equipment and boots." That myth has long since died.

But not so the argument over the identity of the bird that has been part of the crest of the Royal Air Force and Commonwealth Air Forces since the earliest days of our air arm, and adorns the buttons of our airmen today. Is it an eagle or an albatross?

This once burning issue about the bird's true identity has all but flickered out, and members of our air forces today have been informed "officially" that it is an eagle.

You have but to mention this to the originators of the myth that it was an albatross (the veterans of the Royal Naval Air Service in the First World War), and you will find yourself involved in an argument that will last the night through.

If the unwary pilot officer of this generation is tactless enough to mention this to one of these die-hards, the light of battle will come into his eye and his arguments will be pressed home with a ferocity that will end in the abashed young officer tactfully agreeing that it is not an eagle at all, but—as any idiot can plainly see—an albatross.

If it were possible to submit the question to an eagle or an albatross to decide,

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it is certain that after one glance at our "bird," both would deny parentage of such an offspring; so we must turn to official authority for the decision; and, oddly enough, the decision in the first place that it was an eagle, came from the Admiralty.

If, as the original designer claims, the drawing submitted was intended to be an albatross, even the Lord Commissioners of the Admiralty failed to recognize it and issued the following order on 23rd June, 1914:

> "*Admiralty Weekly Order No. 2.*—The badge of an eagle will be worn by members of the R.N.A.S. at the top of the left sleeve."

The eagle was also substituted for the anchor on buttons, cap badges and other insignia.

As we are dealing with the origin of purely Air Force traditions and customs, it is necessary to carry the official assurances that this bird is an eagle still farther.

In 1918, on the formation of the Royal Air Force, a minute of an Air Council meeting states that the force's badge was to include an eagle. The official description of the Royal Air Force crest is described as follows:

> "In front of a circle, inscribed with the motto, 'Per Ardua ad Astra,' and ensigned with the Imperial Crown, an eagle, volant affrontee, the head lowered and to the sinister."

This was registered on 26th January, 1923, after it had been submitted to the College of Arms on 23rd January, and after receiving King George V's approval.

As regards the bird worn on arm badges, etc., reference can be made to the *R.A.F. Equipment Vocabulary* (A.P. 1086), which describes them as "Badges, Arm, Eagle." The highest authority, the Air Ministry, still state emphatically that the bird on the crest and badges in use by the Air Force is an eagle.

So from birth it was an eagle and an eagle it will remain, unless that small band of albatross enthusiasts can persuade some future Air Minister to exchange the bird's legs and feet for "floats" and rechristen it an "eagletross" or "albatreagle." Until such unlikely happening there is little they can do to revive the old misleading rumour about it, except mutter beneath their breath that it's not an eagle but an albatross; but with such overpowering official proof to the contrary they will convince nobody.

A. H. S.

[*The Editor would welcome the origin of any other symbols, Air Force traditions or customs which still survive.*]

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THE AIR FORCES IN PARLIAMENT

SERVICE interest in Parliament has recently been focused on three topics: Defence, the Service Estimates and Foreign Policy. Unfortunately there is only space to deal with the first two.

DEFENCE

The Minister of Defence summarized the Government's defence plan for 1950 thus: (i) To continue with our Allies, the closer integration of our defences under the Brussels and North Atlantic Treaties; (ii) to maintain overseas the British Forces necessary to security; (iii) to continue to give the highest priority to defence research and to increase the production of modern equipment; and (iv) to seek to build up the Regular strength of the Army and the R.A.F. while maintaining National Service.

The Leader of the Opposition (Mr. Winston Churchill) said that, in his opinion, more information should be given to the House about all the three Services. It was not right, for instance, that the House of Commons should be so much worse informed about our defences than the Soviet Government. He also protested against the Government's view, expressed in the last sentence of the White Paper, that the scheme for selecting for National Service a smaller number of men, by ballot or otherwise, was impracticable.

Mr. Churchill then turned to the wider aspects of military affairs and said that the decision to form a front in Europe against a possible further invasion by Soviet Russia and its satellite states was both grave and imperative. But it was his opinion that a long front could not be defended without the active aid of Western Germany. Britain and France, united, would be strong enough to extend their hands to Germany. Just beyond Germany's eastern frontier lay the enormous military array of the Soviet and its satellite states, far exceeding in troops, in armour and in air power all that the other Allies had got. We were unable to offer any assurance to the Germans that they would not be overrun by a Soviet and satellite invasion. If the Germans were to have neither a guarantee of defence nor the opportunity of contributing to the general framework of defence, they could console themselves with the reflection that they had no military expense to bear. They could also comfort themselves with the important advantage this relief from taxation gave to German commercial competition in all the markets of the world.

"It is obvious and imperative," he continued, "that the Navy should manage its own air service. Nevertheless, in the sea war of the future it is the air which will decide the fate and fortunes of ships of war. Therefore, the aircraft carrier with proper naval protection must increasingly replace the battleships of former times." In the next few years we should have to face the Germanized Soviet U-boat. The strength of the Soviet U-boat force, according to Soviet propaganda, was 250. *Brassey's Naval Annual* regarded this as a reliable figure and added that between seventy-five and 100 of these were of war-time or post-war construction. An entirely new type of U-boat had been developed. Instead of a ship going eight or nine knots under the water and having to come up to breathe at comparatively short intervals, they had a type of U-boat which could manœuvre below the surface at upwards of twenty knots or thereabouts. By the use of the breathing

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tube (*'Schnorkel' or 'Snort'*) it could make passages of thousands of miles without appearing on the surface. Happily, however, all things were on the move together, and here the naval air and longer-range land-based aircraft came to the aid of the Navy. The light type of aircraft carrier, if provided in sufficient numbers, could search immense areas of sea." He submitted to the House that the main emphasis of our naval effort at the present time should be to create the largest numbers of light fleet aircraft carriers and auxiliary carriers capable of carrying the necessary modern types of aircraft.

Coming, then, to the general air problem, Mr. Churchill said there never had been an air force of the size that the Soviet had built and were building in time of peace. In the air, quantity was best defeated by quality; but no one could say that a sufficient quantity could not overwhelm superior quality. We therefore required far larger numbers of the highest-class aircraft than we now possessed. Fortunately and providentially there was the American Air Force, far stronger than ours and of equal quality, and we had allowed them to establish in East Anglia a base for their bombing aircraft, the significance of which could not be lost on the Soviets. He could not understand why a British Government in these circumstances had allowed anything to diminish the supply of jet aircraft upon which our deterrent against war, and our survival if it came, alike depended. He did not know how many had been sent or given to Egypt to reduce her "sterling balance"; but it was already public knowledge that 100 jet fighter aircraft had been sold to the Argentine for little over £2 million.

"Let us therefore labour for peace," he concluded, "not only by gathering our defensive strength but also by making sure that no door is closed upon any hope of reaching a settlement which will end this tragic period when two worlds face one another in increasing strain and anxiety."

* * * *

In the course of winding up the debate, the Prime Minister (Mr. Attlee) said there was a tendency to suggest in some quarters that because we had the atom bomb we had no need of other weapons. That was quite absurd. Dr. Vannevar Bush had made it clear in his recent book that in the view of the scientists the advent of atomic bombs does not make all other weapons obsolete. There was a limit to the amount we could spend on our defences, because at the base of all defence must be a sound economic position. It was all a question of balance—balance between our economy and our defence, and balanced Defence Forces.

HOUSE OF LORDS

Viscount Bridgeman suggested "that the task of our Defence Forces at the present time, and for a long time to come, is to oppose Communism wherever it threatens our own survival or the safety of those peoples for whose protection we are responsible"; and he mentioned in particular Malaya, Indonesia, Indo-China and China itself. General Marshall had said that the United States were engaged in a perilous struggle with an implacable foe. The same held good for Western Union and for ourselves. The whole world situation and the whole fight against Communism was of one piece.

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Viscount Trenchard referred to Mr. Winston Churchill's declaration that Western Germany must be considered by everyone looking to the defence of Western Europe and that Western Europe could not be defended without the aid

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of Germany; and he said that if Western Germany were not allowed to join in that plan, then Germany would arise again one day and she would go East and not West. We could not find the man power to keep out 200 Russian divisions if we did not tap all the sources of man power of the nations concerned in the Atlantic Treaty and the Brussels Pact, and Germany was now an associate member of the Brussels Pact.

* * * *

HOUSE OF COMMONS—THE AIR ESTIMATES

In introducing the Air Estimates, the Secretary of State for Air (Mr. Arthur Henderson) emphasized the fact that Fighter Command's jet fighter force was being doubled and he also said that all our day fighter and ground attack squadrons overseas were now re-equipped with jet aircraft, excepting those squadrons operating in the Far East. Orders had been placed for the production in quantity of a new type of jet fighter, the Venom, which would have a performance exceeding that of the Vampire in all respects. The Venom would be coming into the squadrons next year; and it would in turn be followed by jet fighters of much more advanced types, with speeds approaching that of sound and capable of operating at extreme altitudes.

Orders had been placed for the production of a jet night fighter in sufficient quantity not only to re-equip the existing night fighter squadrons but also to expand the night fighter force itself. These jet night fighters would be fitted with up-to-date radio and radar aids and would be capable of operating by day in weather conditions in which the day fighters would be grounded. Furthermore some extremely valuable work was being done on an advanced air-to-air guided missile designed to improve the effectiveness of our fighters against the modern bomber. It was the Government's aim, he said, to enable our fighters to attack and destroy the modern bomber from ranges beyond those of its defensive armament. They were also planning to modernize and extend the control and reporting system.

Turning to Bomber Command, the Secretary of State said he had been allotted this year seventy B.29 aircraft under the Military Aid Programme and we hoped to receive further supplies later on. The B.29 had a much higher performance than the Lincoln in range, speed and ceiling, and it carried nearly twice the bomb load. The Canberra, a twin-jet bomber which had been ordered last year, had successfully completed its initial flying trials and rapid progress was being made in preparing it for introduction to the Service as a fully operational type. Squadrons equipped with the Canberra should be in service next year. The B.29 and the Canberra would constitute the main equipment of our bomber striking force until the more advanced types already contemplated were available.

Coastal Command had continued to develop the technique of anti-submarine warfare in close co-operation with the Navy. All Coastal Command squadrons go through a course at the Anti-Submarine School every year, and they take every opportunity of training with units of the Fleet.

Turning now to economies, Mr. Henderson said: "It was only after the most careful and anxious consideration that the Air Council came to the conclusion that, in order to secure the vitally important increases in Bomber and Fighter Commands, there was no alternative but to reduce the size of the transport force in the United Kingdom."

The net result of these changes was an increase in the front-line strength of the Royal Air Force, which was being achieved with a much smaller man-power force.

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The recruiting position remained unsatisfactory and the general level of experience in the Service would decline with the discharge of a large number of tradesmen on the completion of their bounty engagements, unless a considerable number of them were willing to re-engage. There was still a lack of balance between trades and serious deficiencies in some of the most vital and highly skilled trades, e.g., radar and wireless fitters and armourers; and a number of measures had been taken during the year to redress this unbalance.

By way of solution to the man-power problem, they were concentrating training in the largest and best schools at their disposal and were contemplating a revision of the ground trade structure, so as to provide assured careers for a large number of men and to introduce long-service careers, as foreshadowed when the new pay code was introduced, in the hope that much greater numbers would be induced to re-engage for twenty-two years or even longer up to the age of 50 to 55.

A scheme had recently been adopted to enable R.A.F. pilots to be provisionally pre-selected for appointments with the civil aviation corporations and charter companies.

Although recruiting for the Royal Auxiliary Air Force and the Royal Air Force Volunteer Reserve had not been as rapid as they would wish, recruits were coming in steadily and were of good quality. The fighter squadrons of the R.Aux.A.F. had now taken up their operational place under Fighter Command, where they would later on be joined by the Fighter Control units, in accordance with the phased programme for the constitution of our first-line force.

Our links with the United States Air Force remained very close; the development of a unified Air Defence Organization covering Western Union had made good progress during the past year; and a considerable number of British jet fighters had been supplied to these Allies.

Mr. Henderson devoted the last part of his speech to housing. The Home programme for 1950-51 was for 4,000 new permanent quarters, which, on completion, would give a total at Home of nearly 17,000 quarters. One-third of the 1950-51 programme would be for officers' quarters. They were also planning to double the rate of building married quarters overseas. They had, moreover, introduced a scheme under which the Air Ministry would rent suitable houses or flats for married officers and airmen. The rent would be paid by the Air Ministry and the occupant would be charged at the rate which he would normally pay for a married quarter.

* * * *

Squadron Leader Kinghorn invited the House to agree that "continued efforts must be made to secure the best servicing and maintenance procedure in the Royal Air Force consistent with the economical use of trained man-power"; and he suggested that, where two or more R.A.F. aerodromes were close together, the necessary servicing and maintenance might be performed centrally with consequent economy in staff and overheads. He also expressed his opinion that the integration of Service life with civilian life "should go very much farther than it does at the moment," so that a man's Service job would be a continuation of his civilian job, and a civilian job could be a continuation of the Service job, too.

The Secretary of State for Air explained that while centralizing those services certainly made for economy and was both practicable and desirable in static organizations, central servicing and maintenance could not be so freely and profitably adopted in the Royal Air Force. The R.A.F. was an organization "geared for war" and its tactical operational squadrons had to be ready to move

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quickly and at short notice from place to place, so each one needed to have its own servicing and maintenance staff. He also pointed out that the planned servicing scheme had in fact effected a great economy in man power without loss of mobility, by insuring an even and steady flow of work through the station workshops; and he said that Flying Training Command, by experimenting on those lines and by carrying out inspections at fixed intervals of time instead of after so many hours flying, had reduced the time each inspection takes to one-third of what it was before, had reduced the number of aircraft going unserviceable by one-third, and had cut the number of man-hours spent in servicing by one-half.

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Air Commodore Harvey asked whether Halton was full and if not what steps were being taken to get additional apprentices into that school. He also expressed concern because Cranwell was not full. And he put forward various reasons for the shortage of voluntary recruits, e.g., poor prospects of a career, too frequent postings and insufficient pay and allowances. By way of increasing the attractions of the Service he suggested that the cooking of the food should be improved, that more attention should be paid to the training and status of cooks, that the arrangements for purchasing and maintaining uniform should be revised and that a smart and light-weight walking-out jacket for summer wear should be provided for airmen. Mr. John E. Haire called upon the Secretary of State to insist, when dealing with his Service colleagues and the Minister of Defence, that the Royal Air Force was now the Senior Service. (*Many other members made valuable contributions to the debate but unfortunately space does not permit of any further extracts here.*)

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A FISHERMAN'S YARN

THE EXCUSE

STRONG drink affects men in a variety of ways. Some become boisterous, raise their voices needlessly and laugh unnecessarily loudly, others become maudlin and whisper their supposed grievances confidentially to anyone willing to listen. There are those that become belligerent and will pick a quarrel with their best friend, and some will just fall asleep. Good wine and good company do none of these things to me; they have a worse effect. I become sickeningly egotistical. I cease to be that most acceptable of men in good company, a good listener. If not skilfully side-tracked by my friends, I become that most frightful menace who usually begins with: "I must tell you what happened to me the other day, you'll enjoy it, it's a scream."

The difficulty of obtaining sufficient of the stimulant that brings on these nostalgic recountings of my own adventures, owing to its scarcity and everyone's reduced finances, there is little danger of my becoming more than an occasional menace to my friends, but the gift of a bottle of Gonzalez Superior has caused me to sink even lower. With my bottle at my elbow and none to sidetrack my desire to recount my "Fisherman's Yarn," having disarmed criticism by the foregoing, I propose to tell a story that at the moment seems humorous to me and I hope will, the egotism being forgotten, be of interest.

THE STORY

Normally I lead a very social life, not because I like it, but because I have a wife who is socially inclined. Apparently to succeed in life one must meet "the best people," change for dinner every night and give and accept endless dinner parties. Added to this, of course, dinner nights in Mess and guest nights. Having reached saturation point of this kind of life at Cranwell, at the end of December a very welcome leave of six weeks arrived and we left for London. Here formal tea parties were added to my burden, and in the evenings once again that stiff, uncomfortable collar and the boiled stiff shirt for parties at the Savoy, Mayfair, Berkeley and other hotels. Finally, I rebelled; the longing for the wide open spaces, comfortable clothes and less artificial surroundings proved too much for me. Leaving my wife with my mother-in-law, I packed a bag and left for a small seaport. To my brother officers my behaviour during the next few days would have seemed distinctly odd. I grew quite a healthy stubble by neglecting to shave; from a marine store I obtained a *very* secondhand fisherman's suit and jersey, both slightly too big for me, and a not very handsome cap. I had ceased to be an officer and a gentleman—at least, in appearance. Each day I joined a very reticent, but restful group of dock loafers. In that bitter cold weather I must have looked particularly hardy without an overcoat, leaning up against my favourite shed, smoking my old pipe, but appearances were deceptive as I had on two thick wool vests as I'm most susceptible to the cold. It was peaceful. I was enjoying the reaction after my normal mode of life. On the fifth day I achieved my purpose and was taken on as a cook on one of the trawlers. Had my job been confined to cooking I should have been a much more efficient member of the crew than I eventually proved to be, but after we sailed I discovered that I was also expected to undertake duties on deck as a trawl-hand, of which I knew nothing.

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The Lord Roberts was an old sailing trawler with a small auxiliary engine, only brought into use to help forward progress while the trawl was out and dragging along the bed of the sea. The skipper, a fine old boy of seventy-three in high sea-boots, blue jersey and blue fisherman's cap, ran the trawler with a crew of five. The cabin in which I cooked reminded me of the ships as they were in Nelson's day, as anywhere down below it was quite impossible to stand upright. In that small, confined space was not only the cooking range of the type to be found in most small houses, but also the auxiliary engine, which, when started up, gave off fumes that made breathing difficult and were so acutely painful to the eyes that I could not tolerate them for more than a short spell at a time. When the fumes of my cooking were added to those of the engine, the cabin was filled with a fog which reduced visibility to two yards.

Soon after we had put to sea I was called upon to undertake my first duty as a deck hand. It was to assist in lowering the trawl. Along the scuppers rested what looked to me like a large scaffold pole, and it appeared that the idea was that I should help two of the crew lift it up on to the side of the trawler and then drop it over into the sea. We all bent over it and got the order, "Heave Ho!"

We heaved heartily, but nothing happened. It seemed unwilling to leave the scuppers. We tried again with no better result; then the man on my left stood up, put his hands on his hips and regarded me as if I was a bad smell, and said, sarcastically:

"'Ere, wot the 'ell do you think your a'doing? Are you supposed to be 'elpin' or merely assistin'." Then he roared at me:

"Get yer bloody feet off the net." I had been standing on the net to which the pole was attached.

Later I was given a lighted hurricane lantern and told to hang it on the foremast. This, in the dark, with a high sea running that pitched the trawler from side to side violently, was no easy task for a novice, but to make up for my earlier ignorant blunder I staggered along the heaving deck and on reaching the small, sloping rope ladder, with the lantern in one hand, I proceeded to swarm up it at a brisk rate. So great was my hurry that in the darkness I failed to observe that two rungs were missing. I promptly fell straight through the hole on to the deck below, which wrecked the lantern and shook me up considerably. The rolling of the trawler was such that, had I fallen a second later, I should probably have fallen into the sea instead of into the scuppers.

The skipper's observations were colourful to a marked degree and most informative as to my doubtful ancestry.

In the early hours next morning the trawl was hauled up, swung over the centre of the deck and then the bottom of the net opened. A mass of live, shimmering fish poured in a heap on to the deck, the gleanings of the bottom of the sea—live fish of every size and shape flipped and flopped or gaped open-mouthed at me. Be-whiskered large fish and clean-shaven small ones, long, thin, short and fat, round and chubby or flat and thin, they were all there. Dogfish snapped savagely and codfish stared stupidly. Large crabs tried to escape by creeping off stealthily, and eels slithered their way in and out of that wet, shiny heap.

The sorting began immediately. Along the scuppers near by were many wooden boxes, one special sort of fish being thrown into each box. Not being able to tell the difference between a plaice and a sole, some care on my part was necessary, so seeing a fish unmistakably different from all the others, I turned to the man next to me and pointed to it.

"'Ere mate, what's that?"

"A Miller's Thumb. What the 'ell d'yer think it is, a bloody mermaid?"

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"All right, narky, I'm sortin' Miller's Thumbs."

Now sorting a pile of wet fish in the middle of the North Sea in mid-winter is a cold job. Very soon my hands were so frozen that I had lost the use of all my fingers, so I surreptitiously put on a very ancient pair of gloves that I had in my coat pocket. Soon after I had a feeling that someone was standing over me, and on looking up I saw the skipper, scorn written all over his face.

"That's right, me lad, don't cher get yer 'ands wet," he said.

When the sorting was finished the trawl was lowered again into the sea and another hand and I were told to turn in. We retired to that pokey cabin which only contained one bunk, into which the skipper climbed. I made preparations for dossing on the floor. To make myself comfortable I adopted the old tramps' trick. Taking off my boots I placed the soft sides inwards, rolled them in my spare waistcoat and put the whole under my head for support. Again I incurred the old man's sarcastic displeasure.

"Oh! Soft are yer?" he called out from his bunk. "'Ere, 'ave me feather pilla, me lad," and drawing out the sack that was under his own head, he tossed it down to me. The crash that followed could have resulted only from bottles and old tins, so I declined and replied that I'd rather rough it.

I would not like to convey a wrong impression of that grand old man or any members of his crew by these references to their reactions to my amateurish efforts as a new hand. They were good companions and in their rough way very tolerant and kind to one so raw as myself. They soon ceased offering me such advice as to "lower a bit of fat bacon on a string down your throat and gently bring it up again" as a cure for sea-sickness when they found I was a good sailor. On the whole they seemed amused at my blunders and most interested in some of the information I gave them about the various customs of the Arabs and life in the desert. After a hard day's work I was soon lulled to sleep by the pitching and rolling of that little vessel.

After a few days' experience I soon became a more useful member of that crew. Better companions it would be hard to find. Their cheerfulness under most trying conditions was marvellous, and one such incident particularly impressed me. On our last trip out we had trawled for about six hours and when we eventually hauled in, not only were there no fish, but our net had a huge gaping hole in it and was useless. It had been dragged across some old wreck on the bed of the sea, and not only had they lost the whole catch but it meant putting back into port for repairs. With men as poor as they were this was a very serious business, but although there was bitter disappointment on everyone's face, there was no hard swearing or bad temper. They just shrugged their shoulders and silently stowed the net, and as the skipper turned away and wandered to the tiller to put the little vessel on its course for home, I heard him mumble something about "fisherman's luck."

Each trip out from port was an adventure and I was thoroughly enjoying myself, but my leave was rapidly coming to an end. At the end of my third fishing trip, to avoid the embarrassment of receiving my 3s. per day as cook and my crew's share of the sale of the fish, I quietly disappeared from the vicinity. By contrast, my subsequent shave and hot bath were pleasurable; to be in a large easy chair and see that bell-push which had just brought me a large whisky and soda was Heaven. I even took some satisfaction at gazing at myself in "tails and a white tie" in the long mirror in my bedroom. Such is egotism.

A. H. S.

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[*War Office Photo*

R.A.F. Representative Association Football Team against the Army and Royal Navy
A.C. Bilcliff, Sergeant Keen, Corporal Larder, A.C. South, A.C. Evans, Flight Lieutenant Sawyer, A.C. McEwan, Corporal Jackson, Corporal Barnicle (captain), Corporal Wilson, A.C. McMillan

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Imperial Services Championships, 1950. The Royal Air **Force team**

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SPORT IN THE R.A.F.

By J. Sephton

ASSOCIATION FOOTBALL

In the Inter-Services Championships for the Constantinople Cup the Royal Air Force were beaten by the Army, who gained the Championship by also defeating the Navy. The match between the Royal Navy and Royal Air Force ended in a draw, each side scoring two goals.

It took extra time this year to decide the winner of the Inter-Command Competition. After a keenly contested game, Technical Training Command defeated Maintenance Command by one goal to nil.

No less than 106 stations entered for the Open Cup Competition. At the Stadium, Uxbridge, Royal Air Force, Halton, by defeating Royal Air Force, Leuchars, by 4 goals to 1, became the winners for two years in succession.

Even in the Junior Cup Competition, open to units below a strength of 500, there were ninety-nine teams competing. By defeating Royal Air Force, Sutton Bridge, in the final, held at the Stadium, Cranwell, by 2 goals to nil, No. 101 P.D.C., Warton, became the new champions.

Air Marshal Sir Leslie N. Hollinghurst, K.C.B., K.B.E., D.F.C., the Air Member for Personnel, who is also President of the Royal Air Force Football Association, presented the trophies and medals for the last three-mentioned competitions.

The support given by R.A.F. stations to the R.A.F. Football Association during the 1949-50 season tends to prove that this is the most popular game in the Service.

BASKETBALL

This year's Inter-Services Championships were held at the Royal Naval Barracks at Chatham. Once again the Army proved too strong for the Navy by defeating them by 54 points to 35 points, and although the Air Force had a somewhat overwhelming victory over the Navy by 73 points against 41 points, they were defeated by the Army by 31 points to 20 points, which made the Army once again the Inter-Services champions.

In the Inter-Command Championship all Home Commands entered representative teams. After a most exciting game, Fighter Command became this season's champions by defeating Technical Training Command in the final. Fifty stations entered for the Inter-Station Championship, which was won by R.A.F., West Kirby, who defeated R.A.F., Cranwell, in the final.

BOXING

Enthusiastic support and keenly contested matches were again to be seen during the competition for the Lord Wakefield trophies. R.A.F., Spitlegate, carried off the officers' trophy, Little Rissington won the senior and Calshot the junior competition. All Home Commands and No. 90 Group competed in the Inter-Command Boxing Competition, and in the finals, at R.A.F. Station, Uxbridge, Maintenance Command defeated Bomber Command.

CROSS-COUNTRY RUNNING

The 1949-50 Cross-Country Championships were held this year in two sections. Eliminating races were held at R.A.F. Stations, Newton, Cosford, Henlow, Upper Heyford, St. Athan and Halton.

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Eighty-eight stations entered teams of nine runners, the first three teams and the first twelve individuals in each area going forward into the final, which was held at R.A.F. Station, St. Athan, on 4th March, 1950.

Aircraftman Pirie, R.A.F., Cranwell, was the first man home, covering the six-and-a-half-mile course in 43 minutes 16 seconds, with Flight Lieutenant Stone, Air Ministry, second, 9 seconds later.

R.A.F., Cranwell, won the team event with 154 points, Upper Heyford being second with 163 points, and the third place being filled by St. Athan, with 168 points.

The Inter-Services Championship, which was run over the course at R.A.F. Station, Halton, was again won by the Army with 39 points, Royal Air Force being second with 47 points, and the Navy third with 96 points.

ROAD WALKING

The Royal Air Force Seven Miles Road Walking Championship was this year over a course in Shropshire. R.A.F., Halton, "A" team won the competition with 19 points, R.A.F., Bridgnorth, being second with 24 points. The Individual Championship was won by Corporal Howard, of R.A.F., Bridgnorth, who completed the course in 56 minutes 47 seconds.

HOCKEY

Inter-Station and Inter-Command Competitions for both R.A.F. and W.R.A.F. were held during the season, all four competitions being well supported.

R.A.F., Yatesbury, defeated No. 24 M.U., Stoke Heath, in the final of the R.A.F. Inter-Station Competition, and R.A.F. Station, Wilmslow, won the W.R.A.F. Inter-Station Competition, beating Hawkinge by 2 goals to 1 in the final.

Technical Training Command won both the W.R.A.F. and R.A.F. Competitions. They defeated Transport Command in the men's competition and Flying Training Command in the women's competition.

The Royal Air Force won the Inter-Services Championship by beating the Army by 6 goals to 4 and drawing with the Royal Navy. In the Army-Navy game the result ended in a 2 goals to 1 win for the Army.

NETBALL

Netball in the Women's Service is equally as popular as soccer is in the men's. Eighty stations entered the Inter-Station Competition during the season, R.A.F., Cosford, winning the Championships for the second year running. They defeated R.A.F., Duxford, by 21 goals to 6 in the final.

Technical Training Command won the Inter-Command Competition, beating Maintenance Command in the final by 17 goals to 7.

The representative W.R.A.F. team again won the Inter-Services Triangular Tournament by defeating the W.R.N.S. by 17 goals to 10 and the W.R.A.C. by 21 goals to 12.

RUGBY UNION

Three competitions were organized by the Royal Air Force Rugby Union during the 1949-50 season: Inter-Unit Shield, Inter-Unit Challenge Cup and Inter-Command Competition.

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Squadron Leader R. H. G. Weighill, D.F.C. (R.A.F., Cranwell), captain, R.A.F. rugby representative team and English international

R.A.F. Station, West Kirby, won the Shield Competition from an original entry of 128 teams, R.A.F., Yatesbury, being runners-up.

R.A.F. Station, St. Athan, defeated R.A.F., Cottesmore, for the Inter-Unit Challenge Cup by 3 points to nil, after extra time.

In the Inter-Command Competition, Flying Training Command proved themselves worthy champions by defeating Bomber Command in a hard-fought game.

The inter-Service matches were again keenly contested, the Army winning the championship by defeating the Royal Navy and the R.A.F. The R.A.F. *v.* Army match was drawn 6 points each.

SAILING

In the absence of news of what is taking place at home in this grand sport, we include a picture to show that at least the Far East are showing considerable interest in sailing. This picture was received from the R.A.F., Changi, Yacht Club, in which the new Air Officer Commanding-in-Chief of Bomber Command not only took a great interest, but was a keen competitor in the Far East regattas during his tour as Commander-in-Chief of that Command.

At these regattas the R.A.F. Yacht Club at Seletar and civilian yacht clubs in Singapore and Johore take part; on a recent occasion ninety-four boats of all classes competed.

The R.A.F., Changi, Yacht Club was founded in February, 1946, to provide facilities for sailing, motor-boating and small-boat racing for all ranks of all Services within the Changi encampment.

We should like to hear something of the activities of the 1,000 sailing enthusiasts in the Home Commands, and whether the R.A.F. Sailing Association has organized any special events for them this season.

[Air Ministry Photo

Sailing. Signs of activity at Changi, Far East

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AIR FORCES FORUM OF DISCUSSION

(Write to the R.A.F. Quarterly about it)

LETTERS TO THE EDITOR

15th April, 1950.

DEAR SIR,

I first wondered about the possibility of the destroyer aircraft when I was thinking about the numbers of men required for preparing home defence missiles and aircraft. It seems that there is a vast field for technical investigation in this general subject and, with an arrangement for more weapons to be carried by less aircraft, I suggested an advance. I add that I have no specific interest in rockets as such and proposed this scheme to combat bombers coming in a stream of a reasonable density, within a twenty- or thirty-mile "box," as suggested in Mr. Sheffield's letter as being the range of rockets.

I assumed, maybe wrongly but certainly with foundation of present fact:

(*a*) That radio-controlled rockets would have difficulty in their individual reception if launched, say, 500 at one time.

(*b*) That coverage for ground control of England's shores for these rockets would involve a vastly greater number of people than necessary; because with the controllable range shorter than that of aircraft the rocket stations would be spaced more closely and idleness of the majority at any time would be inevitable.

(*c*) That readers knew the theory of a state of equilibrium between two forces and that they had been around the world a bit.

(*d*) That planes and rockets could be matched in speed and climb.

I wonder why Mr. Allward is so dogmatic about his "forces" and is so staggered after sketching a launching cradle. An anti-gravity force exists every time a rocket ascends vertically, and when the destroyer constellation is in equilibrium gravity will not affect any part of it differentially. For equilibrium, therefore, gravity exists no more effectively than it does when a boat streams down current at the end of a rope. Here are two forces, opposing each other and visible for Mr. Allward's information; there is the current and the rope.

Mr. Allward's sketch of the launching cradle should include, for comparison (*a*) a Fighter Command runway, some 2,000 yards long; (*b*) a complete 10,000-ton tanker which Group Captain Cartmell, in the April issue, describes necessary for the fuel of the aircraft in a single big Bomber Command operation; (*c*) the accumulation of ground defence armament necessary to produce an equal fire power; (*d*) the size of an atomic explosion if the bombers are not stopped. Size is relative, and naturally such a cradle is bigger than a rocket rack on a

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fighter, but it won't be as big as, say, a pit-head winding gear or as costly as the transport for a month's output of anti-aircraft guns from factory to gun-site.

Finally, I do not agree with Mr. Sheffield that "a ground position is not only a much harder target to attack (than an aircraft by aircraft) but is also much easier to defend." This is a statement that would settle once and for all the arguments on how a country should be defended.

Yours faithfully,

NIGEL WALKER, *Group Captain.*

DEAR SIR,

On reading the article, "Defence and Offence," by Air Marshal Sir Robert Saundby, in your April number, I could not help but feel that the Air Marshal had added to the confusion surrounding the terms "defence" and "offence" as applied to air operations. My own knowledge of the subject is purely academic, born of study for the promotion examinations, and it is therefore with a feeling of temerity that I venture to criticize the words of so distinguished an officer as Sir Robert.

Surely, in any way, the occasions when strategic offensive air operations are carried out are very few. In my opinion the following might be so termed:

(*a*) The initial strategic air operation of the war and succeeding strategic air operations by the aggressor whilstsoever he retains the initiative and adheres to his original aim.

(*b*) After losing the initiative and regaining it, strategic air operations by the aggressor.

(*c*) Air operations, except those in tactical support of the still fighting land armies, when one side or the other has obtained absolute mastery of the air under similar conditions to those which prevailed in Europe just prior to VE Day.

Any other strategic air operation logically falls in the category of defensive. To take the Air Marshal's example—the attacking of German war industry and communications—by his very statement, "If it succeeded, the enemy's war material would be insufficient to support his offensive war plan," would seem to me to indicate that such operations were of a defensive character. If the air operations assist in the aim of reducing the enemy's ability to wage war, whether the result of the operations is to reduce the number of aircraft he can produce, the number of troops he can move into position, the amount of food he can distribute to his population, the number of guns, ships or submarines he can bring into service, or to make him change his aim from offence to defence, then logically the operations are defensive in character, because by them we are successfully defending what we set out to defend at the onset of the war. It is well to remember that an unsuccessful defence is no defence at all.

This reduction of the majority of strategic air operations to a defensive nature, however, does not alter the fact that each and every one is also tactically offensive in character.

If, then, as the Air Marshal says, we shall never be the aggressor, then our policy should be to design a force capable of:

(*a*) Going on to a tactically defensive role immediately an intending aggressor launches his initial attack.

(*b*) Retaining the initiative in our own skies.

(*c*) Extending the field of our initiative and advancing to a strategic defensive role.

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Up to this point my letter is a mere quibble of terms. The Air Marshal continues in his article to say, "All our resources, including our air striking force, will have to be concentrated on the task of breaking up the enemy's attacks upon us and our allies, with the most punishing losses. If we can do this the enemy will find that his offensive plan, on which he has staked so much, has failed and he is liable to falter, considering what next to do. Now is our opportunity. . . ." I would like to have read in his article more emphasis on not "if we can do this" but on "we must do this." Unless our tactical defensive role is short and successful we will never have the resources or the ability to change to a strategic defensive role. Our Army, Navy and Bomber Force will be a mere pantomime chorus of villagers and destined to play a no more useful part in the plot. I repeat, unless we are successful in the first phase, our historic past, our social insurances, our aspirations for the future, and our homes and institutions will be as so many memories and possibly not even that.

As I see the present shape of things we will be lucky to get away with another Battle of Britain let alone a Dunkirk or a Norway. Let us have an inspired campaign to arouse the British people from their seeming apathy, and let us have it now. It will be no use attempting to inspire a lot of disintegrated atoms.

We do not need a large citizen army organization, for if the first air phase is lost, such an army will be disorganized and ineffective. We do need a large and effective civil defence organization. Above all, we need a large and effective air defence organization in being, and that predominantly fighter aircraft. For us to be successful in the first phase the majority of the attacking bombers must be destroyed, not only before they reach our shores, but before they reach any vital targets in Western Europe. If the R.A.F. is designed to achieve this, then there will be little to fear from airborne troops. If we cannot insure Western Europe from mortal destruction from the air, then defence against airborne troops on the ground will be futile. If the second Battle of Britain is lost then the Western World is lost.

When the second Battle of Britain or the Air Battle of Western Europe is won by us then the United States must be ready to immediately launch its strategic bomber defence and so prevent any further air onslaught and also pave the way for our defending armies to advance and bring the war to a successful conclusion. The bases for this bomber force should be prepared now and manned with skeleton staffs in order to provide the requisite mobility.

It is my opinion that, nationally, the cornerstone of this defensive policy (whilstsoever the cold war exists) is the channelling of every possible resource, scientific, economic, inventive and industrial, into the creation of sufficient of the best possible weapons to insure Western Europe against mortal destruction from the air, and the serving of those weapons with a highly trained predominantly Regular force.

The simplification of logistics, training, administration and planning which would result in the concentration of our present force of three almost equal arms, one of which is an all-purpose air force, into predominantly one arm and that designed for tactical air defence with an eye to it being changed into a tactical offensive air force as the next war progresses in our favour would, I imagine, be considerable.

In conclusion, it seems to me that unless we plan something along these lines we are living in a fools' paradise or a nightmare, depending on one's outlook, and are destined for extermination both as a nation and as individuals.

Yours faithfully,

A. F. RANSFORD, *Flight Lieutenant.*

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OUR COMMONWEALTH AIR FORCES

ROYAL CANADIAN AIR FORCE

AN ARCTIC "COOKERY BOOK"

COOKERY books and jet planes would appear miles apart, but what is perhaps the world's most unusual cookery book has been prepared by the Royal Canadian Air Force, and is being used in connection with survival training given to aircrew engaged in Northern flying.

The R.C.A.F.'s contribution to the culinary world—complete with directions on how to prepare Lousewort—may never oust *Good Housekeeping* from Canadian kitchens, but to flyers downed in the Far North it may be far more important, for the material it contains might mean the difference between life and death.

Few Canadian housewives would become enthused over serving a tasty dish of Lousewort for hubby's supper. Even an advertising genius would have a tough time making Canadians Lousewort-conscious. But the Air Force manual points out that the woolly Lousewort, "found in the tundra, growing five to eight inches tall, with pink or purple flowers, is the most tasty food plant in the North, the root being the edible portion." That information might some day save the life of a flyer.

The cookery book is not too worried about catering for fastidious tastes; its main interest is with what will keep you alive. The following quotation gives an idea of the author's approach:

"Nearly all animals in the North are safe to eat—bats, lizards, newts, frogs and even snakes, which taste like the white meat of chicken. Grubs found in the ground or in rotten wood make good food. So do grasshoppers, toasted on a stick. Pick off legs and wings before cooking. Do not eat caterpillars; some are poisonous. Meat is meat when you are hungry."

The Air Force manual covers about thirty edible forms of plant life found in the Arctic and sub-Arctic, giving a description of the plant, and recommended ways of cooking. More than fifty different animals, birds and fish are included, and the cookery book gives many hints on how to catch your Northern dinner in the first place.

Common types of poisonous plant life found in the North are also covered, as well as information concerning certain animals and sea food which are unfit or poisonous to eat at certain times of the year.

The manual advises the flyer finding himself living off the country not to be discouraged by the bare appearance of Northern vegetation. Food is often hidden

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and must be sought out. It states that for years people have thought the North to be a land of plenty, as far as wild forms of foodstuffs are concerned. It never was, says the manual, and during recent years game animals have been killed at an alarming rate. Finding food material, and preparing it for consumption is where the know-how comes in.

Following are a few of the items covered in the new manual:

Dandelion.—A weed pest in the South but a potential life-saver in the Polar regions. Both leaves and roots may be eaten raw, and the leaves make fine greens if cooked like spinach.

Sea Cucumbers.—These queer-looking animals have the shape of cucumbers. Throw away the insides and scrape away their slimy outer skin. Cut them and cook in a stew or else fry.

Lemming.—Lemming are stub-tailed mice that range throughout the Arctic. In winter they nest on or near the ground, deep in snow drifts, and you will have to dig for them. In summer you can find them by over-turning flat rocks. You can get them also by hitting them as they scuttle along their runways or by setting snares of very fine wire along the runways. Lemming are constantly preyed upon by shrews, weasels, foxes and owls.

Fish.—All Northern fish are edible. All salt-water fish may be eaten raw except shark. Fresh-water fish in the North may contain parasites that make you sick, so cook them if possible.

Mussels.—Most Polar mussels are edible. Avoid any that do not shut up tight when you touch them. They are either sick or dead and unfit for food. Avoid the black mussel, about two inches long, that is attached to rocks by rough threads. This mussel sometimes becomes deadly poisonous in summer-time and cooking does not destroy the poison.

These are but a few of the items covered. The cookery book ranges from Arctic mice to polar bears and walrus, and in the case of larger game provides detailed advice on how to avoid becoming a meal for the animal.

The cookery book forms part of the syllabus prepared for the R.C.A.F.'s School of Survival, at Fort Nelson, B.C., which has trained more than 200 aircrew in techniques of beating the Northland. Primarily responsible for its contents are two R.C.A.F. officers with years of experience in the Far North. The two, Flight Lieutenant S. E. Alexander (37) and Flying Officer R. J. Goodey (38), are both former Mounties.

The pair stress that nothing in the manual is theoretical—it all comes from actual experience, and it actually works. Neither of them may be any great shakes when it comes to whipping up a chocolate cake, but when it comes to finding food in the Far North they are among Canada's top men.

Arctic authorities say that the cookery book portion of the manual alone could have saved hundreds of lives in the Arctic in the last 100 years, including members of such parties as the Franklin Expedition of the middle nineteenth century, which perished mainly through lack of Northern know-how as regards food. A condensed version of the manual is included in the R.C.A.F.'s Directory of Hinterland Aerodromes, several volumes of which have been completed, and which is available through the King's Printer to all Northern flyers.

TRANS-POLAR WAR RESEARCH

A gleaming new R.C.A.F. North Star aircraft, specially modified by Canadair for experimental studies of aircraft icing and prevention against this hazard, is now engaged on its year-round search for the worst weather on the continent. The aircraft, known as the "Rockcliffe Ice Wagon," is the successor to half a dozen

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R.C.A.F. aircraft employed on this type of work since 1941. Virtually a flying laboratory, the "Ice Wagon" is manned by an R.C.A.F. crew and carries a team of scientists from the Cold Weather Laboratory of the National Research Council.

The new "Ice Wagon" is an odd-looking aircraft, equipped with a high, shark-like fin set in the middle of the fuselage, and a number of perspex observation blisters strategically placed throughout the aircraft. The fin is used for experimental work in electro-thermal wing de-icing. On the inside of the aircraft intricate equipment measures the density of clouds, their water content, determines the effect of ice on propellers and there is even an instrument which gives the pilot visual warning of icing conditions.

Icing conditions, dreaded by all pilots, are encountered at temperatures ranging from above freezing to forty below zero. National Research Council personnel have pioneered in anti-icing research, and as early as 1935 General A. G. L. McNaughton, then head of the Council, pointed the way to electro-thermal heating as an answer to the problem. Today one of the National Research Council developments in general use is a special leading edge cover for propeller blades, which when electrically heated, can rid propellers of any type of ice.

PROTOTYPE TRANSPORT AIRCRAFT FOR R.C.A.F.

Delivery is expected this summer of a long-range, high-altitude, four-engined transport built by Canadair Ltd., of Montreal. This aircraft (a single model only of which is immediately contemplated) is a development project initiated by the R.C.A.F. The new aircraft will be pressurized and will be fitted with four Pratt & Whitney radial engines.

Prime value of the aircraft to the R.C.A.F. is the provision of an aircraft suitable for long-range, high-altitude crew training and at the same time serving as a prototype model for possible future military transport types.

The aircraft will be able to carry two complete crews. In addition it will be equipped to carry thirty-three passengers, the same number as carried by passenger North Stars, now in service. Sleeping accommodation will be provided for a total of twelve.

The engines used in the new aircraft are Series R2800 Pratt & Whitney, developing approximately a total of 7,000 horse-power. The aircraft is a modification of the highly successful North Star transport now in service.

Since the British Merlin engine is used in the North Star and in order to provide against any serious interruption and supply of engines or parts from England during a period of war, the R.C.A.F. has felt that it should have on hand a well-tested conversion of the North Star transport in which engines manufactured on this continent can be used.

This aircraft has been built to test such an engine conversion.

The new transport, although fitted for training purposes and passenger carrying, is a prototype development which could be quickly developed to a long-range military transport, capable of carrying heavy freight, casualties or troops. There is no immediate intention of providing further models of this aircraft for the R.C.A.F. Development of the prototype model, however, means that production could be quickly effected, in event of emergency, of a transport type fitted with either radial or in-line engines.

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ROYAL NEW ZEALAND AIR FORCE

PERSONNEL NOTES

Recent appointments include the following:

Group Captains:

G. H. H. Proctor, R.A.F., as Director of Technical Services.

C. C. Hunter, O.B.E., as Director of Technical Policy.

Wing Commanders:

W. G. Woodward, O.B.E., as Commanding Officer, R.N.Z.A.F. Station, Woodbourne.

J. W. H. Bray, as Director of Air Staff Policy and Plans.

D. W. Baird, A.F.C., as Director of Operations and Flying Training.

K. W. Trigance, D.F.C., as Acting Officer Commanding R.N.Z.A.F. Headquarters, London.

T. J. MacLean de Lange, D.F.C., as Air Representative, New Zealand Joint Services Liaison Staff, Melbourne.

C. A. Turner, O.B.E., as Commanding Officer, R.N.Z.A.F. Station, Taieri.

R.N.Z.A.F. RIFLE MEETING

The R.N.Z.A.F. held its first Rifle Meeting at Trentham on 20th-24th February. Interest in shooting has increased considerably in recent years, fostered by the A.M.P., Air Commodore Wallingford, and much of the credit for getting it organized on a sound basis is due to Flight Lieutenant I. S. Rockell, of Air Headquarters.

Air Commodore Wallingford will be remembered by many who have shot at Bisley over the past twenty years. In 1929, as a Flight Lieutenant, he was the first R.A.F. officer to win the Queen Mary Prize. His most recent success was in the R.A.F. Meeting of 1948, when he won the Post Members' and Old Comrades' Challenge Cup.

Eight Stations entered teams for the R.N.Z.A.F. Meeting, and two teams from the Royal New Zealand Navy also took part. It had been hoped to make it a full Inter-Services' Meeting, but the Army was not able to enter.

In the teams' match, Ohakea "A" team were the winners, with Wigram "A" second and Air Department "A" third.

Two series of matches were shot under S.R.(a) and S.R.(b) conditions respectively.

Group Captain G. E. Watt, O.B.E., A.F.C., R.A.F., presented a cup for the best individual aggregate in the Service series. He himself returned the best score, but as he did not compete for the cup it was won by Air Commodore Wallingford.

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Scores (possible 435) were:

1. Air Commodore S. Wallingford, Air Headquarters 357
2. Sergeant D. J. Caughley, Ohakea 356
3. Flight Lieutenant H. L. Homer, Ohakea 349

The S.R.(b) series, with a possible of 200, resulted in:

1. Flight Lieutenant H. L. Homer, Ohakea 162
2. Sergeant D. J. Caughley, Ohakea 161
3. Warrant Officer P. B. Cullen, Hobsonville 158

SQUADRON LEADER J. E. DUNCAN, M.B.E.

The retirement of Squadron Leader Duncan in April ended a career of fifty years with New Zealand's armed forces and deprived the R.N.Z.A.F. of its most known and best-loved personality. By the accepted standards of *King's Regulations* and the laws of nature, he should have retired long ago; but for years he has been as nearly indispensable and irreplaceable as it is possible for a man to be.

His military career started in 1900, when he joined the Wellington Naval Cadets as an instructor. He left them in 1908, to join "D" Battery, New Zealand Field Artillery Volunteers, and four years later enlisted in the Royal New Zealand Artillery Permanent Force.

He sailed with the main body of the New Zealand Expeditionary Force in 1914, and between then and 1919 served in Egypt, Gallipoli, France and Germany. At the end of his war service he was Regimental Sergeant-Major, 3rd Brigade Artillery.

After returning to New Zealand he spent five more years with the Artillery, and then transferred to the Permanent Staff. From 1924 to 1937 he was Infantry Instructor at the Army Training Depot at Trentham, and an instructor of secondary school Cadet Corps in Wellington.

He transferred to the R.N.Z.A.F. in 1937 at the beginning of the pre-war expansion programme, and was appointed Station Warrant Officer at No. 1 F.T.S., Wigram. In 1942 he was commissioned in the rank of Flight Lieutenant and posted to Air Headquarters as Disciplinarian. The following year he was promoted Squadron Leader.

In 1944 the R.N.Z.A.F. Band toured the Pacific war zone, and Squadron Leader Duncan was appointed to command it. Under his direction the tour was an unqualified success, and the band created a profound and favourable impression with the American troops. A tour of Australia, also under his command, in 1945 was equally successful.

Since the war he has been stationed at Air Headquarters, and at the time of his retirement he was Staff Officer, General Service Training.

Squadron Leader J. E. Duncan, M.B.E. (ret.)

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Stories about him are legion, and only half of them are apocryphal. During his thirteen years with the Air Force he has always been known as the "Bull," in tribute to his parade-ground voice. It is said that a pilot coming in to land heard him exhorting a batch of recruits to "pick up those feet," and instinctively retracted his undercarriage.

As a disciplinarian he was superb, and scrupulously fair. If it was a bad thing for an airman to be walking out with dirty buttons or a scruffy uniform, so it was for an officer, and both were pulled up for it. The mere knowledge that the "Bull" was somewhere within a radius of twenty miles was sufficient to make all ranks give thought to their appearance and behaviour.

A lifetime of dealing with young men has given him a deep understanding of them. While he has probably dealt with more offenders than any other officer in the R.N.Z.A.F., he has at the same time helped many more men when they have been in real trouble.

As far as I know there is nobody in the Service—and most of us have passed through his hands at some stage of our careers—who is not sorry to see him go and does not wish him well in his retirement.

REALISM IN TRAINING

By Wing Commander W. C. Thomas, R.N.Z.A.F.

IN time of peace, the Air Force has two inter-related contributions to make to the national economy:

(*a*) Insurance against attack.

(*b*) Training for the requirements of modern war. Regardless of the intention or organization of the Air Force, the system of training automatically functions as part of the educational system of the nation.

Of these two components, insurance against attack is one of the national overhead expenses and is a dead weight on production, whereas Air Force training in achieving its primary aim also makes direct contribution to overall national efficiency.

This is likely to be the taxpayer's point of view, and accordingly he expects that Air Force organization in peace time will hinge on training. He will also appreciate that the effectiveness of a modern Air Force depends on quality rather than numbers, and up-to-date aircraft and equipment are dependent for effective use on the availability of personnel of the highest mental calibre. In every way the personnel factor in the modern man-machine fighting unit presents a more difficult problem than the supply of up-to-date equipment. Personnel of all ranks must have reasonable native intelligence, considerable moral and mental fibre, a high standard of trade proficiency, initiative, and adaptability to new and changing techniques, princles and machines. In officers and N.C.Os. are needed well-developed powers of leadership; breadth of view engendered by the open mind; and a clear insight into the conduct which must govern their relations with airmen, with civilians, with allies, and in case of war, with the enemy. All wars are now total wars, and in order to be fully effective the Armed Services must be geared to work in harmony with all other elements of the nation. This important objective is to be achieved partly by organization, but more completely and finally by education and training. The attainment of this objective involves "give and take" and probably more "give" than "take," because defence is only one of

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many functions of our national organization, and civilians cannot ordinarily be expected to have had the type of training necessary, or to realize the necessity.

In the achievement of the general and particular aims of the Air Force, education and training have dual and combined responsibilities. The difference between "training" and "education" has been defined as the difference between the process of instruction leading to specialization in a particular technique, and the broadening type of instruction which provides a thorough indoctrination in the principles of modern war and an understanding of the responsibilities and ideals of citizenship.

Much has been said about "push-button" warfare; but the fallacy in most of the arguments is that "push-button" warfare requires a "push-button" man-machine fighting unit. Of these two components, the "push-button" man is not only unattainable, but quite absurd. The real facts are that as fighting machines become more scientific and intricate, not only does the load on specialized training becoming heavier, but the need for a deep educational process becomes progressively greater. In particular, education must induce a logical solution to the unexpected military problem in face of changing techniques, and original and clear thinking based on a sound appreciation of a particular situation, and not a memorized patter.

In time of peace the funds available for expenditure on defence are limited, and from time to time retrenchment is necessary. In addition, the taxpayer rightly expects full value for the money actually spent. Whenever the amount devoted to training has to be reduced, the question is: which aspect of training must be curtailed? As a matter of general principle, apart from detailed economies possible in each one, which is more important—specialized training, general Service training, or educational training? At first glance, specialized training seems to take first place, but when full consideration is given to all factors it comes last. There are three main reasons:

(*a*) Educational training is the basis of all training, so that a sufficient educational standard should be maintained at all cost.

(*b*) General Service training develops *esprit de corps* and morale. Without it the Air Force would deteriorate in tone and real discipline.

(*c*) If it becomes necessary to reduce costs, supply is always affected immediately. It follows automatically that for immediate purposes a corresponding reduction can be made in specialized training (and particularly technical training).

(*d*) Provided educational and general Service training are sufficient, additional specialized training can be given as supply of equipment improves. On the other hand, if educational and general Service training have been sacrificed, it is not only possible, but almost certain, that the more advanced training necessary cannot be given without undue waste of time, effort and money; and then only with mediocre result.

In creating a first-class Air Force (preserve us from a second-best poker hand, and also from the notion that numbers can make up for lack of quality) the first problem is how to attract recruits with the required mental endowment. Both the taxpayer and the employer are apt to forget that the Air Force requires not only first-line aircraft but also men—its fair share of the best men. Nevertheless, it is also true that a properly balanced view of this matter must be taken within the Air Force itself. It cannot be stressed too often that in time of peace, the Air Force must offer more than good rates of pay, and a sound system of specialized training. The additional factors which are vital to success in recruiting may be summarized as follows:

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(*a*) It is rather important that the Air Force should become recognized as a profession with dignity, tradition and social standing. The achievement of this factor depends less on the behaviour and attitude of personnel in higher ranks than on the personal worth of airmen, recruits and potential recruits. In relation to their numbers, personnel in the lowest ranks are observed and appraised by a very large section of the general public; and also, of course, the recruits of today are the potential officers of tomorrow. This looks like a "vicious circle." It seems that to enlist recruits with high mental endowment, the Air Force must first possess first-grade airmen. The solution to this problem rests primarily on educational tradition. The schools have direct control over the boys required, and nowadays parents are swayed by the opinions of post-primary principals and careers advisers. If the Air Force includes an educational programme which is understood and respected by the principals of secondary schools, and sets an educational standard at entry which is carefully maintained at the highest level consistent with staffing needs, then recruiting will become progressively less difficult.

(*b*) It is a well-known fact that in selecting a suitable education for their boys, most parents are swayed more by tradition than by logic. Planning for a career certainly occurs to them, but they are frequently inclined to leave the choice of a career to the boys themselves and to careers advisers. In addition, they are susceptible to the influence of custom, and favour the type of education which is in current social favour. For this reason, although technical schools provide the type of education which directly prepares the average boy for earning his living, the academic programme of the secondary and private schools is popularly held in higher esteem. It is the secondary and private schools which will continue to enrol the best boys, and it is from the secondary and private schools that the Air Force must hope to enlist its best recruits. It follows that the Air Force must include within its organization not only a good system of technical training, but general and academic education of a character (up to University level in some cases), and which will be respected and valued by secondary school principals and that large group of people who favour an academic bias to education. The all-embracing question is—under what conditions would you permit your own son to join the Air Force?

(*c*) The tradition of the Air Force is an all-important factor and must be built up inside the Service before it will be observed by people outside. Sound tradition is pride in past achievement, and is not, as some seem to think, the sum-total of eccentricity. Both people and organizations are usually measured by the standards which they set for themselves. The foundation of Air Force tradition as an active power is the teaching of Air Force history.

The process of education and training by means of which we may hope to evolve the ideal Air Force, may be roughly divided into the following interrelated phases:

(*a*) *The Phase of Initial Indoctrination.*—At this stage the Air Force must convince raw recruits that the finest profession is the profession of arms; and that, in particular, it is an honour and privilege to belong to the Air Force. It is reiterated that the main method of achieving this is by developing an understanding of the spirit, ideals and tradition of the Service from studies of Air Force history.

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(*b*) *The Phase of Specialized Training.*—To be completely successful, all technical and flying training must aim at producing aircrew and tradesmen who will be capable of adapting themselves to new equipment and to new techniques, with absolute certainty and minimum loss of time. All short cuts and rule-of-thumb methods which may be valuable in war time should be carefully pruned from the schools in time of peace.

(*c*) *The Phase of Active Experience.*—During this period, personnel will gain practical experience in their specialist duties, and as opportunity offers will develop their powers of leadership. Research has revealed that war-time experience showed that there is a close relationship between breadth of education and capacity for organization and command. This being so, personnel must be encouraged to study in their own time at this stage. This may be accomplished primarily by organizing promotion examinations of various kinds.

(*d*) *The Phase of Higher Training for Total War.*—This phase should include technical training at University level; higher training in Service administration, tactics, strategy and supply; training in national security alongside civilians who will hold key positions in an emergency; and higher general education to offset the narrowing effect of specialization and to preserve the open mind.

The principles which should govern this phase may be summarized as follows:

(*a*) That although the Air Force exists primarily to preserve peace, every member must be confident of its ability to resist attack. This is a matter even more of training and of personal attitude than of equipment.

(*b*) That the ultimate objective of an air force is to carry the war to the enemy, and to recognize and to destroy the foundations of his national structure.

(*c*) That the objectives (*a*) and (*b*) above cannot be achieved with a "second-best poker hand."

(*d*) That the Air Force is merely the striking edge of the whole nation geared for war, and the part must work in complete harmony with the whole.

(*e*) That education must be sufficiently wide to enable immediate exploitation and use of new techniques, and early adaptation of new technical and scientific discoveries.

(*f*) That precision in thought, writing and speech, and ability to produce an accurate appreciation of a situation, or orders which cannot be misunderstood will win campaigns. The study of English as a means for conveying an exact meaning is a matter which concerns not only the officers who give the orders, but the men who carry them out. Each word in its context must start a spring of action, consistent in all respects with the original intention.

(*g*) That understanding of the circumstances of the enemy must be as complete as may be possible at any particular time. This includes not only the information usually supplied by the Intelligence Officer, but a thorough grasp of the social life and customs of the enemy; an outline of the history of his country; his political ideas; the economic structure of his country; and for some personnel, a knowledge of his language.

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[Air Ministry Photo

THE NEW W.R.A.F. BAND UNIFORM

W.R.A.F. officers at their Annual Conference view the new W.R.A.F. Band uniform

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CURRENT EVENTS

UNITED KINGDOM

Royal Observer Corps

HIS MAJESTY THE KING has been graciously pleased to assume the position of Air Commodore-in-Chief of The Royal Observer Corps, which celebrated its Silver Jubilee in April this year. The jubilee year has also been marked by the institution, by Royal Warrant last January, of the Royal Observer Corps Medal for twelve years' service. The title "Royal" was granted to the Corps in 1941, after the Battle of Britain, in recognition of the vital part it was playing in home defence.

Battle of Britain Week

Battle of Britain Week will be observed this year from 11th to 17th September. Battle of Britain Day (Friday, 15th September) will be celebrated in the usual way, with colour-hoisting parades and other appropriate ceremonial, at all Royal Air Force stations. The form of the customary public fly past will be decided by the Air Staff nearer the event and will depend on the over-all programme of the Royal Air Force.

The R.A.F. "At Home" Day will be on Saturday, 16th September, when a number of R.A.F. stations will be open to the public; and on the following day (Battle of Britain Sunday) there will be the customary thanksgiving services.

The proceeds from these "At Home" Days will be given to R.A.F. charities, as usual. Last year nearly £14,000 was raised in this way.

Bands at the R.A.F. Display

Visitors to the Royal Air Force Display at Farnborough on 7th and 8th July will see and hear the largest R.A.F. massed band ever assembled on one occasion. This will comprise the R.A.F. Central Band, five regional bands, the R.A.F. Regiment Band, the Central Band of the Women's Royal Air Force, and the apprentices' bands of No. 1 School of Technical Training, Halton, and No. 1 Radio School, Cranwell. The 400 musicians, directed by Wing Commander A. E. Sims, M.B.E., L.R.A.M., A.R.C.M., Organizing Director of Music in the R.A.F., will give a demonstration of marching and counter-marching in slow and quick time.

The R.A.F. Central Band, which is based at Uxbridge, recently celebrated its thirtieth birthday and is well known to the public and to radio listeners. Its first broadcast was in 1923.

During the war the Central Band had a varied and eventful existence. One section went to France in November, 1939, returning to England in March, 1940. A second section crossed the Channel a month later and stayed until the evacuation of the British Expeditionary Force. The military band, symphony orchestra and dance orchestra visited R.A.F. stations and war factories in all parts of the United Kingdom, and the first two combinations made an extensive tour of the U.S.A. in 1944-45. On the return voyage in the *Queen Elizabeth* the band played to the 16,000 troops travelling in the ship.

The regional bands taking part are No. 1 (based at Weeton, Lancs), No. 2 (Mildenhall, Suffolk), No. 4 (Henlow, Beds), No. 5 (Locking, Weston-super-Mare) and No. 6 (Cosford, Staffs). At Farnborough they will wear for the first time new full-dress uniforms similar to that of the Central Band. In addition to playing at Service and public functions in this country the regional bands carry out extensive overseas tours. In 1948 No. 4 Regional Band made an eight-week

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[Air Ministry Photo

W.R.A.F. Annual Conference of Officers at 23 Knightsbridge

Left to right: *Dame F. Hanbury (the retiring Director of the W.R.A.F.), Colonel G. May, of the United States W.A.F., and Group Officer N. M. Salmon (since appointed as Director of the W.R.A.F.)*

[Air Ministry Photo

Passing-out Parade of Boy Entrants at R.A.F. Station, Locking. Air Marshal Sir R. V. Goddard, K.C.B., C.B.E., inspecting the parade, which is under the command of Sergeant Boy Entrant Lovell

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tour of the Mediterranean area, and last year No. 1 Band spent six months in the Far and Middle East.

Based at Catterick, Yorks, the R.A.F. Regiment Band has had a distinguished career since its formation in 1940. In 1943, on the twenty-fifth anniversary of the formation of the Royal Air Force, it took part in the Changing of the Guard at Buckingham Palace, and in 1945, visited Norway to play at the celebrations attending the return of King Haakon to Oslo.

Youngest of the ten bands in this event is that of the Women's Royal Air Force. Although a W.A.A.F. drum and trumpet band was formed in 1944, the first W.R.A.F. brass band did not come into being until last year, its first public appearance being in the Lord Mayor's procession.

The two apprentices' bands consist of voluntary musicians from the technical training schools at Halton and Cranwell. Halton's pipe band has a goat mascot, "Leading Aircraftman Lewis II," who recently succeeded an older animal, "Flight Sergeant Lewis."

R.A.F.V.R. Schoolmasters at Cranwell

About fifty public schoolmasters, commanding officers of R.A.F. sections in the Combined Cadet Force, attended a four-day course at the R.A.F. College in April and were given a close insight into the operational role of the R.A.F. During the course they also visited a Fighter Command station, a Bomber Command station, the Radio Apprentices' Wing at Cranwell, the School of Land-Air Warfare at Old Sarum, the Transport Command terminus at Lyneham and the Flying College at Manby.

The object of the course was to ensure that these officers were familiar with the role of the R.A.F. in the defence of the country, to impress on them the necessity for encouraging the best type of public schoolboy to join the R.A.F., and to help them to develop the qualities of leadership and discipline in their cadets.

R.A.F. Gliding and Soaring Association

The R.A.F. Gliding and Soaring Association has now started flying at Detling, Kent, and already has available a Weihe and an Olympia, to which a Prefect and a T21B are to be added as soon as delivery can be arranged. Three disused buildings will be converted into a clubhouse to provide accommodation and messing for members. The Association is a member of the British Gliding Association and, as the governing body for all non-public gliding in the R.A.F., represents those interests on the B.G.A. Council through Group Captain G. J. C. Paul, its Chairman.

Plans are in hand to start unit gliding clubs at Mildenhall (Suffolk), Boscombe Down (Wilts), St. Athan (Glamorganshire) and Warton (Lancs), but progress will depend on the Association's ability to obtain gliders and equipment.

The Association will be represented in the international gliding contests (Sweden) by Flight Lieutenant R. C. Forbes (Gold "C"), who will fly the Association's Weihe in the official British team. His ground team of three will include Group Captain Paul. The Association also plans to enter a full team of members holding the Silver "C" qualification for the British gliding contests at Camphill from 22nd to 30th July.

It has now been found possible to provide ab-initio training at a very low cost at Detling, and five weekly courses are to be held there during the summer. Membership of the Association is at present confined to serving members of the R.A.F., but it is hoped later to extend it to the R.A.F. Reserves.

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[Air Ministry Photo

Visit by Colonel G. May, of the United States Women's Air Force, to Fighter Command, R.A.F. Colonel May is welcomed on arrival at the Headquarters, Bentley Priory, by Wing Officer T. M. Hibbert

Balliol and Athena Gunnery Trainers

Boulton Paul Balliol and Avro Athena trainer aircraft from the small preproduction order are to be used by the R.A.F. as dual gunnery trainers.

The Balliol and the Athena were designed to the same specification for a two-seater applied flying trainer, and both have the Rolls-Royce Merlin engine. A small batch of each type was built so that comparative flying trials could be made. As the result of these trials the Balliol was recently selected for full-scale production.

The preproduction Athenas go to the R.A.F. Flying College at Manby, Lincs, and the Balliols to the Central Gunnery School at Leconfield, Yorks. They will replace North American Harvards and Miles Masters.

Use of a side-by-side trainer should result in a marked reduction in the time spent on gunnery instruction. This seating arrangement simplifies the teaching of positioning and judgment, and by the use of dual gyro gunsights the pupil is able to see exactly the same target as the instructor.

Western Union Examining Squadron

The first completely integrated international defence unit to be established in peace time has been set up by the Brussels Treaty Organization in the form of an examining squadron which will standardize the flying training of the Western Union Air Forces and improve the level of proficiency.

It is intended that the tour of duty for instructors shall be at least two years and that the examining squadron shall be based for one year in each of the Western Union countries concerned, the commanding officer being supplied by the country in which it is based.

Much progress has already been made in the co-ordination of training of aircrews, and common rules have been adopted for operational procedures as well as recognition and routeing of aircraft so as to ensure that any Allied aircraft can fly over Allied countries without being engaged by mistake. Harmonized operational procedure has reached the stage where an A.A. fire unit of any country can work under the control of an A.A. operations room of another nation.

* * * *

GERMANY

R.A.F. Farm in Berlin

R.A.F. Station, Gatow, Berlin, famed as the busiest airport in the world during the Berlin air-lift, now claims another distinction—that of maintaining one of the largest farms in the Royal Air Force.

More than fifty-two acres are now under cultivation within the station perimeter, and the cropping plan for 1950 includes twenty-two acres of potatoes, ten

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of rye and oats, and ten of beet, with the remaining area devoted to miscellaneous vegetables and salad crops. Last year a herd of pigs, averaging 120, was also maintained, which supplied fresh pork to R.A.F., Army and Control Commission messes in Berlin. A large poultry section is also to be developed during 1950. The possibility of keeping a dairy herd was investigated, but it was found that the sandy soil produced very poor grazing.

Sales of produce from the farm during 1949 amounted to more than £1,500. The farm is financed by the Service Institute funds of the station, which receive the proceeds of all sales.

The Gatow farm is managed by the station catering officer, Flying Officer N. E. Flemmings (of Park Field Farm, Saddleworth, Yorks), and worked by fifteen Germans, who are paid from Institute funds.

* * * *

MALTA

Social Club for R.A.F. Families

A social club which aims at promoting closer ties between the station's fifty married families has been started at R.A.F. Station, Luqa, Malta.

Group Captain L. F. Brown, the Station Commander, is the president, and in his inaugural speech outlined an all-the-year-round programme for the club. For the summer months picnics, swimming parties and visits to places of historic interest will be arranged, and in the winter there will be social afternoons and evenings, sewing meetings, whist drives, and lectures by eminent visitors. Activities for the children will also be arranged.

It is hoped eventually to obtain permanent quarters for the club, but until these are available the club is using the airmen's rest room for its meetings. The Station Padre is the chairman of the club.

* * * *

MALAYA

Air Operations in Malaya

The tempo and strength of operations against the bandits in Malaya were stepped up by aircraft of the Royal Air Force based in Malaya and Singapore when Lincolns, Sunderlands, Brigands, Tempests and Spitfires took part in forty-six air strikes with a record number of 580 sorties—an average of twelve per strike—during the month of April. Dakota aircraft of No. 110 Squadron also dropped 397,153 lb. of supplies to security forces working in the jungle. This is the highest monthly total yet reached by any one squadron.

Since the start of the emergency the amount of supplies dropped has now reached a total of 3,186,000 lb. During April, Dakotas on air-lifts and communication flights carried over 600 passengers and 2,000,000 lb. of freight. Other activities of the squadrons included air-sea patrols, photographic reconnaissance sorties, air cover for convoys and the dropping of 155,000 surrender leaflets. In spite of periods of bad weather with low cloud and heavy rain, 763 operational sorties were flown. Nos. 94 and 95 Squadrons of the R.A.F. Regiment (Malaya) have been in action against the bandits on several occasions, inflicting casualties and capturing prisoners and important documents.

Formation of Royal Air Force (Malaya)

The formation of the Royal Air Force (Malaya) has been commenced. It is to be a locally recruited technical corps as an integral part of the Royal Air Force and will consist, at first, of 1,700 regular tradesmen, including 700 police.

This proposal further implements the policy of the Royal Air Force overseas

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to make the maximum use of suitable local man power and to strengthen the position between Colonial communities and the R.A.F. Members of the new corps, for which all male British subjects and male British protected subjects will be eligible, will be required to serve in peace anywhere in the Federation of Malaya or the Colony of Singapore, and anywhere in time of war or Commonwealth emergency.

Last of the Lancasters

On 8th March, 1950, the last of the Lancaster aircraft left the Command. It would not be fitting to allow this moment to pass without a tribute to an aircraft which served us so well in both war and peace.

Although not the first of the four-engined aircraft to enter the Service, by 1943 the Lancaster had become the predominant aircraft in Bomber Command, and can be regarded as one of the most potent weapons which contributed to the defeat of Nazi Germany.

There has seldom been an aircraft which has been employed in so many different roles. It was used in massive saturation raids, selected for precision attacks such as that which sank the *Tirpitz*, for low-level raids on the German power supplies, viz., Augsburg and the Mohne Dam, supplied the underground armies of Europe, supported the Army, hunted down submarines, and in the final phases fed starving Holland. In addition, the aircraft served with success in almost all overseas commands.

One should also remember that when introduced to the Command the Lancaster's all-up weight was 58,000 lb., but by the end of the war this had risen to 72,000 lb.

A remarkable fact was the increase in bomb load. Originally designed to carry a maximum-sized bomb of the 4,000-lb. type, the aircraft eventually carried the 22,000-lb. "Grand Slam." This achievement was not equalled by any other bomber aircraft.

Pilots will remember its manœuvrability, the excellent all-round vision from its cockpit, and its smooth and instant response to the controls. Others, too, will remember its rugged construction and the punishment which it could absorb in combat, and yet bring its crew home.

In the immediate post-war years the Lancaster remained the mainstay of Bomber Command. Most of the groups' pilots were trained on this aircraft, and all had confidence in its many excellent qualities.

It is with regret and affection that we say good-bye to a grand old lady, and hope that her successors in Bomber Command will maintain her very high standard.

The Lancaster Bomber (retired)

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BOOK REVIEWS

The Eagle in the Egg. By Oliver La Farge. 320 pp. (Houghton Mifflin Co., The Riverside Press, Cambridge, Massachusetts; $3.50.)

On 14th December, 1941, one week after America's entry into the Second World War, a group of men gathered in Washington to discuss how best to get available U.S. troops and supplies quickly to where they were most needed. The picture was a black one. The Philippines, far off, lay waiting an overwhelming Japanese attack. In the Middle East the British faced the enemy on the borders of Egypt, and could be supplied only by going all the way around Africa, by crossing that continent at its greatest width, or by sailing the whole expanse of the Pacific and Indian Oceans. China was all but completely cut off. To get supplies to Russia required running the hazardous, bloody gauntlet of the Arctic Ocean above Norway, crossing the great wastes of Siberia, or following a long, twisting route to the Persian Gulf and up the whole length of Persia to the Russian border.

The key to the situation was long-range air supply, so "America, the pioneer of aviation, counted its resources. They were ridiculous. Eleven crudely converted Liberator bombers in the hands of the Ferrying Command, a Boeing Clipper which the War Department had purchased from Pan American and eight more still in the airline's possession, two Martin flying boats, and T.W.A.'s five Boeing Stratoliners. None of these was really adequate to the task." The rest of America's highly developed domestic fleet of civil air liners consisted of D.C.3s and Lodestars, competent aircraft for short and medium hauls, but useless for the task in hand. In fact, comments Mr. La Farge, "We thought we owned a great bird, but when we examined it we found it was only an egg from which some day wings might emerge."

The Eagle in the Egg tells how the American Air Transport Command grew from such pitiful beginnings to a mighty force of over 1,000 four-engined transports and 2,000 heavy "twins," able to fly fully equipped army divisions into action and bring back 18,537 sick and wounded in one month, and, later, play an outstanding role in the Berlin Air Lift.

It is a good story, well written, with sufficient humour and personal narrative to make it readable as well as factual. Furthermore, it holds a vitally important moral for the present time, when R.A.F. Transport Command is being pruned drastically to pay for bigger and better offices for civil servants and free wigs and spectacles for "visiting firemen."

J. W. R. T.

Gas Turbines and Jet Propulsion. By G. Geoffrey Smith, M.B.E. 386 pp. (Iliffe & Sons Ltd.; 21s.)

When Geoffrey Smith wrote the original edition of this book in 1942, his was very much a voice in the wilderness. Only a handful of people knew that the first really practical jet plane had already flown in Britain; very few others would have realized its significance even had they known.

The first edition of *Gas Turbines and Jet Propulsion* was, therefore, very much a pioneer work. In it the author reviewed every known design and discussed future possibilities. The fact that the resultant book ran to fifty-six pages was at the same time a tribute to Geoffrey Smith's vision and a proof of how little we then knew about this new form of power plant.

Despite considerable scepticism as to the possibilities of jet propulsion, the little book was an immediate success, so much so that a second edition had to be issued only six months later.

Today *Gas Turbines and Jet Propulsion* is still acknowledged to be the standard work on the subject, but the fifth edition, recently published, bears little resemblance to the slim, cardboard-covered booklet of 1942. Its 386 pages are striking testimony to the speed of gas-turbine progress in less than a decade; its 350 illustrations depict a new generation of aircraft and engines compared with which those of 1942 look almost as old-fashioned as an S.E.5 or Vimy. Proof of its world-wide reputation is that it is being published in the United States, France, Holland, Italy and Spain as well as in the United Kingdom.

Every aspect of this newest of aeronautical sciences is covered, including chapters on how jet engines work and how they are made, on the aerodynamic problems of high-speed flight and the influence of the jet on airframe design. There are descriptions of all leading British and foreign jet engines and aircraft, including sections on rockets, ramjets and compounded units, and a completely new and topical chapter on turbines for road vehicles. In fact, whatever you want to know about jets, you will almost certainly find the answer here in the sort of language that you can understand. No greater tribute could be paid to any work on such a highly specialized subject.

J. W. R. T.

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Problems of Social Policy. By Richard M. Titmus. (H.M.S.O.)

This is the second volume to be published of the *History of the Second World War*, United Kingdom Civil Series (edited by Professor W. K. Hancock). The introductory volume, entitled *British War Economy*, was reviewed in THE ROYAL AIR FORCE QUARTERLY for April, 1950.

This volume deals with the social problems arising from air attack in broad outline and is full of interesting material for the student of war in our time and in particular of the deeper influences of the air assault by modern air forces. It seems to me to provide an essential basis for any estimate of the future effects of air warfare on civil populations and helps to bring into focus our own varied experience of air bombardment, the ordeal of the people during the war which was only vaguely reflected in the Press at the time, and the sombre picture of attack by weapons of mass destruction as painted by the prophets of gloom.

Before 1939 the probable scale of air attack against this country was estimated to be very much greater than it proved to be in the event. The estimate of casualties per ton of bombs was based on the effects of the odd three hundred tons of bombs dropped on this country between 1916 and 1918. This basis suggested that between fifty and seventy people might be killed for every ton of bombs dropped. However many factors were left out in considering the problem and the experience of the war showed that only four or five people were killed per ton of bombs and a further fifteen or twenty injured. Nevertheless, it was as well that the plans for evacuation and hospital accommodation were based on the more pessimistic assumptions.

Broadly speaking, the estimates for casualties were excessive, while the estimates of damage to property were too small. The study does not seek to compare the effects of air attack against this country with those against Germany, but one cannot help reflecting throughout upon the ordeal through which the Germans had to pass and its effects upon the social structure of that country. Indeed, a comparison of damage as outlined in the British Bombing Survey Unit's Report leads one to suppose that in most of the various problems dealt with in this book the point of diminishing returns must have been reached and surpassed in Germany. What is more, it seems that Germany could hardly have withstood the furious blasting she received from the air except under the centralized system of control characteristic of dictatorship.

The social problems are dealt with mainly under the headings of evacuation, care of the homeless and hospitals.

The Government were wise in the circumstances to refrain from making evacuation compulsory although this greatly increased the difficulties of administering the evacuation scheme. The scheme proved to be an effective outlet for many who may have been apprehensive before the full effects of the air assault could be more accurately gauged. People proved to be very reluctant to leave their homes and even to take shelter when they could remain in their homes in an atmosphere of security derived from family *esprit de corps*.

The problems which had to be met in the reception areas are a revealing insight into human nature. In many cases the townspeople, used to that peculiarly pressing form of loneliness which is experienced in overcrowded areas and accustomed to low standards of life, found themselves in uncongenial surroundings in the country where the country folk were used to better standards of life. The reluctance of the townsfolk to leave their lowly tenements was often matched by the reluctance of the country folk to accept them, and these antipathies had their effects upon children separated from their mothers. The whole problem of split families and disturbed education during the most impressionable years of early life is at least one basic cause of the prevalence of juvenile delinquency.

At the beginning of the war the problem of the homeless was not as fully appreciated as it might have been, especially in view of the experience in Spain where it had been the predominant problem in heavily bombed towns. In certain areas the inadequacy of the relief organization gave rise to anger against the Government which might have been dangerous if vigorous measures had not been taken. On the whole it is clear, however, that the gloomy forecasts of the psychiatrists about the behaviour of the population under air bombardment were not realized. The morale of the people remained stable and workers of all classes responded to the challenge in a way which can leave little doubt as to the moral stamina of the people of this country, given inspiring leadership, competent administration and faith in the cause.

The whole problem of the homeless prompted a national heart-searching which soon led to the acceptance of national responsibility for the results of physical and material damage or loss from air attack. This led to the dissipation of former ideas that one standard of hospital treatment and welfare was good enough for the poor and another for the better-off. Indeed, the influence of the air war did much to lay the foundations of the

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welfare state. In considering this evolution it is interesting to compare the welfare schemes for the unemployed in the United States, thinly disguised within the framework of private enterprise. (See *The White House Papers.*)

Before the war the control of hospitals was of various kinds, and most were either municipal or voluntary hospitals. The need to plan the hospital accommodation to accept the expected casualties gave rise to stronger control by the central government and a greater degree of aid to allow people from areas other than the particular municipalities concerned to be treated. This co-ordination of hospital facilities proved also to be the first step in the national health scheme, as it was later to become.

This book provides a glimpse of the influence which air power is having upon the social structure of nations. It also demonstrates the reality of the threat of modern war to civilization and the vulnerability of highly organized national entities, not only to the destruction of their material structure, property, houses and cultural edifices, but also the more fundamental and insidious threat to family life, education and the spiritual and mental health of the children. It is a book which should be read by those who wish to understand the deeper influences of war upon civilization, and is of particular interest to airmen who are now responsible for wielding the main weapons of offence in warfare in our time.

J. R. G-F.

Nelson the Sailor. By Captain Russell Grenfell. (Faber & Faber.)

If there is one thing that airmen should study more than another it is the history and art of sea warfare. Indirectly and in many cases directly we have become the inheritors of much that the Navy stood for and certainly we should aspire to that aggressive spirit so characteristic of our great fighting admirals and of the traditional methods of naval warfare. When the Armada was assembling in the ports of Spain, did not Drake urge his Queen to allow him to sail to Cadiz and singe the beard of the King of Spain yet again? It was the right strategy undoubtedly, but more cautious advisers prevailed and by a narrow margin our strategically defensive dispositions carried the day by dint of the offensive tactics which those great men, Howard, Drake, Frobisher, Hawkins, Winter and company used against the enemy.

"Seek out and destroy" was the watchword of the Navy, and it was never more truly carried to its most furious and logical conclusion than by Lord Nelson. He accompanied the land forces to St. Juan and urged an immediate assault; he gaily assaulted Bastia, in Corsica; he broke the hard-cast tradition of keeping the battle line intact at all costs at the Battle of Cape St. Vincent and prevented the junction of the Spanish van and rear bodies; the enterprise at Teneriffe was frustrated by bad weather and hesitation on the part of his subordinate and could only have been successful by the unflinching execution of Nelson's bold plan; the Battle of the Nile was a victory against a fleet disposed for defence; at Copenhagen it was only Nelson's personality which swayed the timid counsels of the Commander-in-Chief and only Nelson's perseverance which gained the victory despite the order to disengage; and, finally, at Trafalgar almost any other man might have waited for his ships to close up with every precept of tactics to justify him, but Nelson's appreciation of the advantages of time, speed and the value of unhesitatingly offensive action gave him just those psychological advantages in the face of great odds which he had learnt to be the keys of victory.

What was the secret of Nelson's success? The first and undoubtedly the greatest of all factors was his leadership. Character and knowledge were the dominating qualities of the man. His mind was entirely emancipated from the strangling hold of ready-made notions, of preconceived ideas and the fettering influence of traditional thought. He almost took pleasure in breaking up the dogmas of the past and refashioning tactical rules to his own design. He was intensely independent and this accounts for his readiness to overlook the dictates of his superiors. It made him an awkward subordinate and he came near to being broken for this independence which more stereotyped officers regarded as indiscipline. Nelson owes much of his greatness to the freedom of action which his Commander-in-Chief, Lord St. Vincent, gave him in the Mediterranean, where he was able to spread his wings and develop his ideas without the hobbling influence of a superior's counsel. His whole life and energies were concentrated on the sea and warfare, and he was a complete master of his profession.

Nelson indoctrinated his captains with his own tactical ideas so that he knew each one could think and act in accordance with the principles he laid down. He was thus able to decentralize control during battle with confidence, and all that was needed from him was the word for action. Simplicity was the basis of every plan, and those beneath him were free to do their uttermost. Speed and concentration sum up his methods, and for the rest the enemy were kept guessing.

With these tactical methods were combined the greatly superior training of the British in

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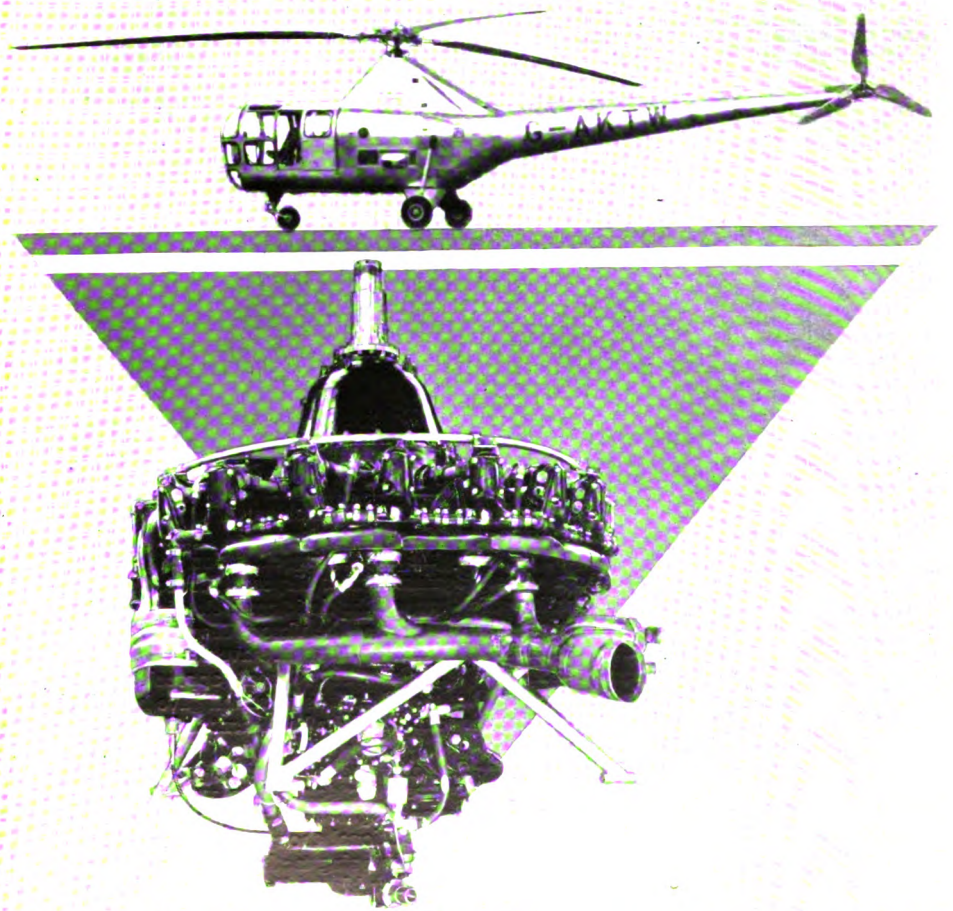

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gunnery. And here we have to note the vital attribute of the British in the wars of history and of today. Just as the English had fired two or three shots for every Spanish shot in 1588 so at Trafalgar the British fired three or even four shots for every French or Spanish shot. Was it not also the disciplined fire of the thin red line at Waterloo which carried the day? And once again in 1940 the eight-gun armament of our fighters became the terror of the Luftwaffe. It is well to remember this, that after all has been laid by the commanders, it is ultimately the morale and the skill and the endurance of the men and the technical efficiency of their weapons which decide the battle. This book reveals how much Nelson relied upon the fighting ability of his men and their weapons, and how he made the opportunities which they could use to their best advantage. Indeed, there is no short cut to close-in fighting; for the infantry it is the whites of the eye, for Nelson's Navy it was to lay the ship alongside the enemy; for the Air Force it is to drive home the attack to the most decisive range.

In strategy there is a lesson for the Air Force in the approach to Trafalgar. We will be numerically inferior. We must seek to divide, divert and "blockade" the enemy's air forces. Above all, we must seek to develop that moral superiority over our enemies which in Nelson's day put the French and Spaniards on the defensive and left the British with all the advantages inherent in the initiative and waiting to be grasped by the force which resolutely pursues the offensive.

Nelson the Sailor deals, as its title suggests, with the great Admiral's character as a leader in war and seeks to penetrate the nebula of glamour which normally obscures this very human character. His unsatisfactory and restless domestic life may perhaps be considered a fault of his virtues. He was nervous, impetuous, prone to entirely erroneous obsessions which can be called more mundanely guess-work, and to say the least of it, casual in his attitude towards the precepts of discipline or the standards of peace-time etiquette. Against this he was fanatically devoted to the cause of his country and to the dictates of honour. It is, above all, his sincerity of character and his utter devotion to his country which was the source of all the moral strength he showed in action.

J. R. G-F.

BOOKS RECOMMENDED

We append a list of books that have been officially "prescribed" (Category "A") and "recommended" (Category "B") for pre-course reading by candidates for a course at the Joint Services Staff College. These books will also be found suitable for officers who are going to the R.A.F. Staff College and, in fact, by all serious students of the subjects covered. Most of the books in this list are stocked by the R.A.F. Central Library at Cosford, and they may be borrowed from there by other R.A.F. stations on application to Station Education officers. (*N.B.—Books of which no price is quoted are out of print.*)

CATEGORY "A"

A Layman's Guide to Naval Strategy. By Brodie. (Oxford University Press.)
Statesmen and Sea-Power. By Richmond. (Oxford University Press; 18s.)
National Policy and Naval Strength. By Richmond. (Longmans.)
British Strategy. By Maurice (Constable.)
Imperial Policing. By Gwynn. (MacMillan; 12s. 6d.)
Armament and History. By Fuller (Eyre & Spottiswoode; 12s. 6d.)
The Foundations of the Science of War. By Fuller (Hutchinson.)
Air Power and Armies. By Slessor. (Oxford University Press.)
Air Power and War. By Tedder. (Hodder & Stoughton; 9s. 6d.)
Bombing and Strategy. By Dickens. (Sampson Low; 7s. 6d.)
Bomber Command. By Harris. (Collins.)

CATEGORY "B"

The Second World War. By Churchill. (Cassell; 25s. per volume.)
The Second World War. By Fuller. (Eyre & Spottiswoode; 21s.)
The Second World War. By Falls. (Methuen; 15s.)
Operation Victory. By De Guingand. (Hodder & Stoughton; 25s.)
Alamein to the Sangro. By Montgomery. (Hutchinson; 25s.)

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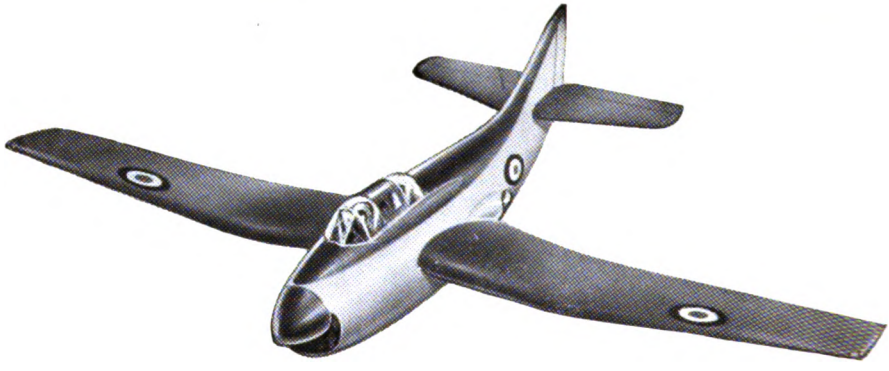

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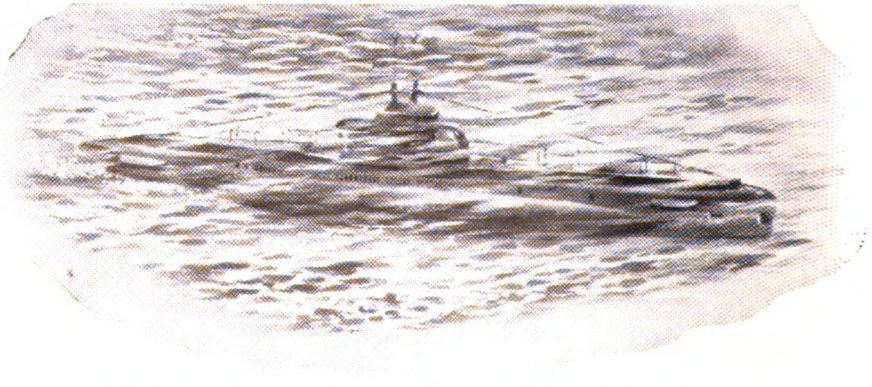

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Normandy to the Baltic. By Montgomery. (Hutchinson; 25s.)
Crusade in Europe. By Eisenhower. (Heinemann: 25s.)
The Other Side of the Hill. By Liddell Hart. (Cassell; 10s. 6d.)
Defeat in the West. By Shulman. (Secker & Warburg; 15s.)
Paiforce. (H.M.S.O.)
Strategy in World War II. By Burne. (Cambridge University Press; 5s.)
The White House Papers. Volumes I and II. By Sherwood. (Eyre & Spottiswoode; 30s. per volume.)
My Three Years with Eisenhower. By Butcher. (Simon & Schuster.)
Middle East—A Study in Air Power. By Guedalla. (Hodder & Stoughton; 10s. 6d.)

Other books which will also interest officers are :

WAR : HISTORIES AND SOURCES

Eastern Approaches. By Maclean. (Jonathan Cape; 18s.) The personal experiences of Brigadier Maclean, who parachuted into German Occupied Europe as British representative to Marshal Tito.
Rommel. By Young. (Collins; 12s. 6d.) A biography of the German Commander as told to the author by Rommel's widow and son.
Eight Years Overseas, 1939-1947. By Wilson. (Hutchinson; 21s.) Field-Marshal Lord Wilson of Libya describes his war experiences in the Middle East and in Washington.

ATOMIC ENERGY

The Atomic Age. By Blackett and others. (Allen & Unwin; 7s. 6d.) The Sir Halley Stewart Trust Lectures, 1948.

U.S.A.

U.S.A. By Brogan. (Oxford University Press; 5s.) An account of the country, the people, government and politics, religion, literature, sport and films.

U.S.S.R.

Russia. By Pratt and Moore. (Cassell; 12s. 6d.) A concise history from the earliest times to the present day; the development of the present régime, the effect of the revolution on Russian life and the life of the people under Communism are described.

THE BRITISH WAY OF LIFE

The English Heritage. By Finn. (Macdonald; 12s. 6d.) Describes the effect of physical geography on human activities, the shaping of language, law and government and the development of trade, travel and craftsmanship.
British Trade Unions. By Turner-Samuels. (Sampson Low; 7s. 6d.) The story of Trade Unionism written for the interested layman; the history and general structure of trade unions are sketched and their functions described.

COMMONWEALTH AFFAIRS

British Family of Nations. By Coatman. (Harrap; 12s. 6d.) An explanation of the structure and terms of association of the British Commonwealth. Historical, political and sociological developments are traced in detail.
Empire and Communications. By Innis. (Oxford University Press; 15s.) The 1948 Beit Lectures on Imperial Economic History.

WORLD AFFAIRS

Report on the State of Europe. By Smith. (Cresset Press; 12s. 6d.) The social and political consequences of the war in Europe by a leading American foreign correspondent.
The Far East: A Social Geography. By Peterson. (Duckworth; 18s.) A description of the peoples, geography and economic resources of all Far Eastern countries from Western Pakistan to Kamchatka.
Mediterranean Background. By Newman. (Hale; 12s. 6d.) Discusses the people, politics, affairs and international importance of the region.
Malta: An Account. By Luke. (Harrap; 15s.) An appreciation of the island, its people and its history.
Western European Union. By Hawtrey. (Royal Institute of International Affairs; 5s.) An authoritative examination of the implications of Western Union.
A Commentary on the Charter of the United Nations. By Bentwich and Martin. (Routledge and Kegan Paul; 16s.) The comments of two British authors upon the United Nations Charter.
The Malays. By Winstedt. (Routledge and Kegan Paul; 21s.) An account of the civilization of the Malays which reveals them as the inheritors of an ancient and complex way of life.

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HISTORY

From Napoleon to Stalin. By Taylor. (Hamish Hamilton; 15s.) A reflection on the development of Europe, with biographical studies of eminent figures, including Bismarck, Francis Joseph and Lord Salisbury.

Europe in Decay : A Study in Disintegration, 1936-1940. By Namier. (Macmillan; 16s.) A collection of essays based on recently published diplomatic documents and memoirs of European statesmen who took part in the events leading up to the Second World War.

A Study of History. By Toynbee. (Oxford University Press; 25s.) An abridged version of the original work which was published in six volumes.

WEAPONS

Guided Missiles. By Weyl. (Temple Press; 7s. 6d.) The evolution and principles of guided and directed missiles for military and peaceful purposes.

NEW BOOKS

AIR POWER

Air Power and Unification. Douhet's Principles of Warfare and their Application to the U.S. By Louis A. Sigaud (former Lieutenant-Colonel, Military Intelligence Reserve, U.S. Army.) 119 pp., with a two-page bibliographical note on Douhet's works. (Military Service Publishing Co., Harrisburg, Pa., U.S.A., 1949.)

SECOND WORLD WAR

Sea Warfare, 1939-1945. A short History. By Captain John Creswell, R.N. 344 pp. Longmans, London, 1950.)

Infantry Brigadier. By Major-General Sir Howard Kippenberger (Commander of the Second N.Z. Division). 371 pp. (Oxford University Press, London, 1949.) Covers the campaigns in Greece, Crete, Libya, Alamein, Tripoli, Tunisia and Italy.

The Eagle in the Egg. By Lieutenant-Colonel Oliver La Farge (U.S. Air Force Reserve). 320 pp. (Houghton Mifflin Co., Boston, U.S.A., 1949.) The story of the U.S. Air Transport Command in the Second World War. (See Review in this number of THE ROYAL AIR FORCE QUARTERLY.)

Overture to Overlord (with a Foreword by General Dwight D. Eisenhower). By Lieutenant-General Sir Frederick Morgan (COSSAC) (Chief of Staff to the Supreme Allied Commander). 296 pp. (Hodder & Stoughton, London, 1950.)

Combat Command: The American Aircraft Carriers in the Pacific War. By F. C. Sherman (Admiral, U.S.N., retd.). 427 pp. (E. P. Dutton, New York, 1950.)

Eight Years Overseas, 1939-1947. By Field-Marshal Lord Wilson of Libya, G.C.B., G.B.E., D.S.O. (Foreword by General of the Army Dwight D. Eisenhower). 285 pp. Hutchinson, 1950.)

Ill-Met by Moonlight. By W. Stanley Moss. 192 pp. (Harrap, 1950.) Story of the kidnapping of General Karl Kreipe, the German Divisional Commander, in Crete on 26th April, 1944.

Decision in Germany. By General Lucius D. Clay. 522 pp. (Doubleday, New York, 1950.)

INTERNATIONAL AFFAIRS

American-Russian Relations in the Far East. By Pauline Tompkins. 426 pp. (Macmillan, New York, 1949.)

Moscow Mission, 1946-1949. By Lieutenant-General Walter Bedell Smith (U.S. Ambassador to Moscow). 337 pp. (Heinemann, 1950.)

Russia and the West in Iran, 1918-1948. A study in Big Power Rivalry. By George Lenczowski. 383 pp. (Cornell University Press, New York, 1949.) Includes chapters dealing with Iran in the Second World War.

EUROPE

Europe in Decay : A study in Disintegration, 1936-1940. By L. B. Namier. 330 pp. (Macmillan, London, 1950.)

The State of Europe. By Howard K. Smith. 416 pp., with an end-map showing the line of the "Iron Curtain." (Cresset Press, London, 1950.) Author is head of the Columbia Broadcasting System in Europe and wrote "Last Train from Berlin," published in 1942.

U.S.A.

The Department of State. A History of its Organization, Procedure and Personnel. By Graham H. Stuart. 517 pp. (Macmillan, New York, 1949.)

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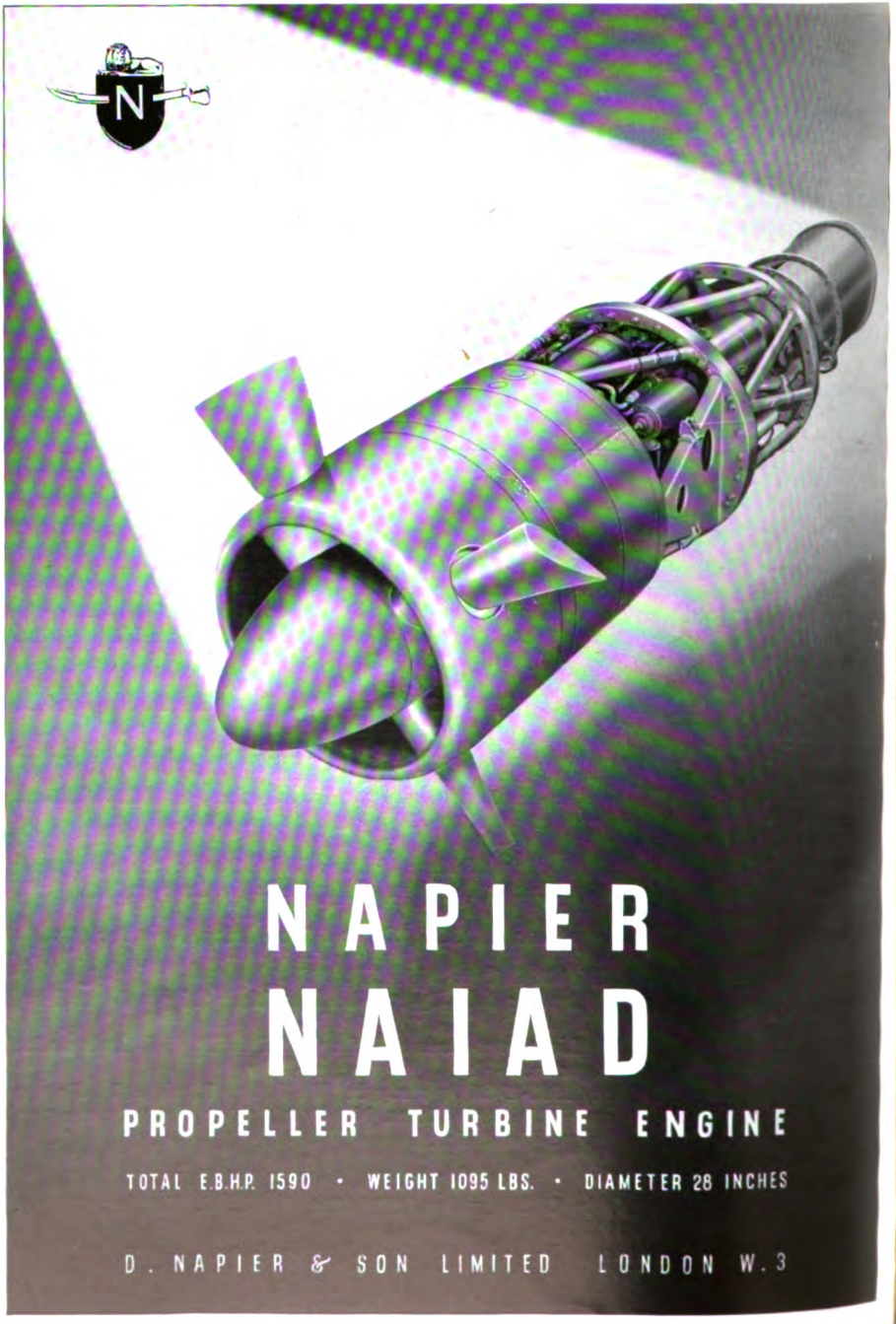
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ARTICLES OF INTEREST IN CURRENT PERIODICALS

"Aeroplane," 3rd March, 1950
"Science and Strategy," by Dr. O. H. Wansborough-Jones. (Brief report of lecture at the R.U.S.I. on 15th February, 1950, by the Scientific Adviser to the Army Council.)

"Aeroplane," 17th and 24th March, 1950
"The Military Glider and its Future," by Alexander Johnson. Part I: Its Role during the War, 1939-45 (17th March, 1950). Part II: Its Future (24th March, 1950).

"Aeroplane," 21st April, 1950
"The Berlin Air Lift," by Air Commodore J. W. F. Merer, C.B. (A brief report of a lecture before the Royal Aeronautical Society on 13th April, 1950.)

"Aero Digest" (U.S.A.), March, 1950
"Survival in the Third World War," by Caldwell. (An examination of the future menace of Russian submarines.)

"Aeronautical Engineering Review," March, 1950
"The Balance of World Power," by Walter Lippmann. (A report of an address before the Institute of the Aeronautical Sciences in New York, 23rd January, 1950.)
"Current Research and Development Trends in Naval Aviation," by Rear Admiral C. M. Bolster, U.S.N.
"Air Force Research and Development," by Major-General D. L. Putt.

"Atomic Scientists' News," March, 1950
"Hydrogen Bomb," by various authors. (A special issue of the journal, devoted mainly to articles on this subject.)

"Economist," 25th March, 1950
"Defence and Diplomacy." (First leading article.)

"Economist," 1st, 8th and 15th April, 1950.
"Defence Policy." A series of articles:
I. "The Strategic Emphasis" (1st April, 1950).
II. "Balanced Forces" (8th April, 1950).
III. "The Mathematics of Security" (15th April, 1950).
"France and Its Army," by the *Economist's* Paris Correspondent (1st April, 1950).
"How Much Armed Force?" Various. (8th April, 1950.)

"Foreign Affairs" (U.S.A.), April, 1950
"Political Ideas in the Twentieth Century," by Isaiah Berlin.
"Strategy for Two Atomic Worlds," by Hanson W. Baldwin, Military Editor of the *New York Times*.
"European Union: False Hopes and Realities," by Halvard M. Lange.

"Inter Avia" (U.S.A.), Vol. 5 (1950)
"The United States Air Force." A series of articles by various authorities.

"International Affairs," April, 1950
"Tito and the Cominform," by Edward Crankshaw.

"National Review," March, 1950
"America and the Hydrogen Bomb," by Denys Smith. (Author is *Daily Telegraph* correspondent in Washington.)

"National Review," April, 1950
"Soviet Air Power," by Jules Menken. (A review of Asher Lee's book, *The Soviet Air Force*—Duckworth).

"Nineteenth Century," April, 1950
"European Union," by W. Horsfall Carter. (The author was attached to the committee which prepared the design for the present Council of Europe.)
"Planning Western Air Power," by Asher Lee.

"Politique Etrangère," Février-Mars, 1950
"La démocratie politique peut-elle s'adapter aux problèmes de 1950," by Bertrand Russell.
"Problèmes de la Chine communiste," by Robert Guillain.

"Quarterly Review," April, 1950
"The Future of the Army," by M. G. Llewellyn.

"R.U.S.I. Journal," February, 1950
"Oil Supplies in War," by Major-General W. E. V. Abraham, C.B.E. (Lecture.)
"Aircraft Design, Development and Production," by Sir Frederick Handley Page, C.B.E. (Lecture.)

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ROYAL AIR FORCE PROMOTIONS AND APPOINTMENTS

Among the promotions and appointments announced by the Air Ministry since the issue of the April number of this journal were the following:

Air Ministry

Air Chief Marshal Sir John Slessor, G.C.B., D.S.O., M.C., to be Marshal of the Royal Air Force.

Air Commodore H. D. Spreckley, O.B.E., as Director of Operational Requirements (B).

Air Commodore G. I. L. Saye, C.B., O.B.E., A.F.C., as Director of Manning.

Air Commandant Nancy M. Salmon, O.B.E., as Director of the Women's Royal Air Force.

Group Officer Lady Seton, as Deputy Director of the Women's Royal Air Force.

Ministry of Supply

Air Vice-Marshal C. P. Brown, C.B., C.B.E., D.F.C., as Assistant Controller of Supplies (Air).

Maintenance Command

Air Commodore C. T. O'Neill, O.B.E., K.H.P., as P.M.O.

Central Fighter Establishment

Air Commodore W. J. Crisham, C.B.E., as Commandant.

Northern Ireland

Air Commodore N. A. P. Pritchett as Air Officer Commanding, No. 67 (Northern Ireland) Reserve Group and Senior Air Force Officer in Northern Ireland.

Canada

Air Commodore A. P. Revington, C.B.E., as Senior Air Liaison Officer with the United Kingdom Service Liaison Staff, Canada.

East Africa

Air Commodore L. T. Pankhurst, C.B.E., as Air Officer Commanding.

United States of America

Marshal of the Royal Air Force The Lord Tedder, G.C.B., D.C.L., LL.D., to Washington as Chairman of the British Joint Services Mission in the U.S.A. and British representative on the Standing Group of the Military Committee of the North Atlantic Treaty Organization.

RETIREMENT

Air Commodore E. A. Lumley, C.B.E., M.C., has retired from the R.A.F. (Medical Branch) and taken up an appointment under the Public Health Service in Lancashire.

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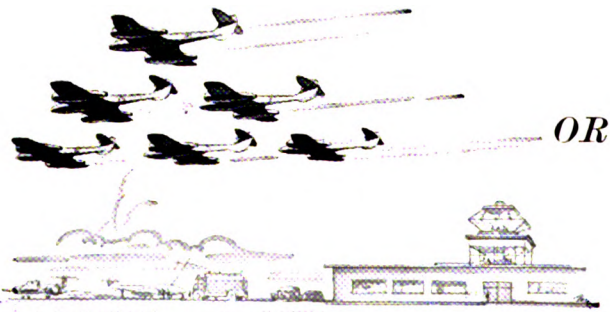

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AND COMMONWEALTH AIR FORCES
JOURNAL

EDITOR
GROUP CAPTAIN A. H. STRADLING, O.B.E., R.A.F. (RET.)

Assisted by an Air Ministry Advisory Committee of members of the Royal Air Force and Air Forces of the Commonwealth

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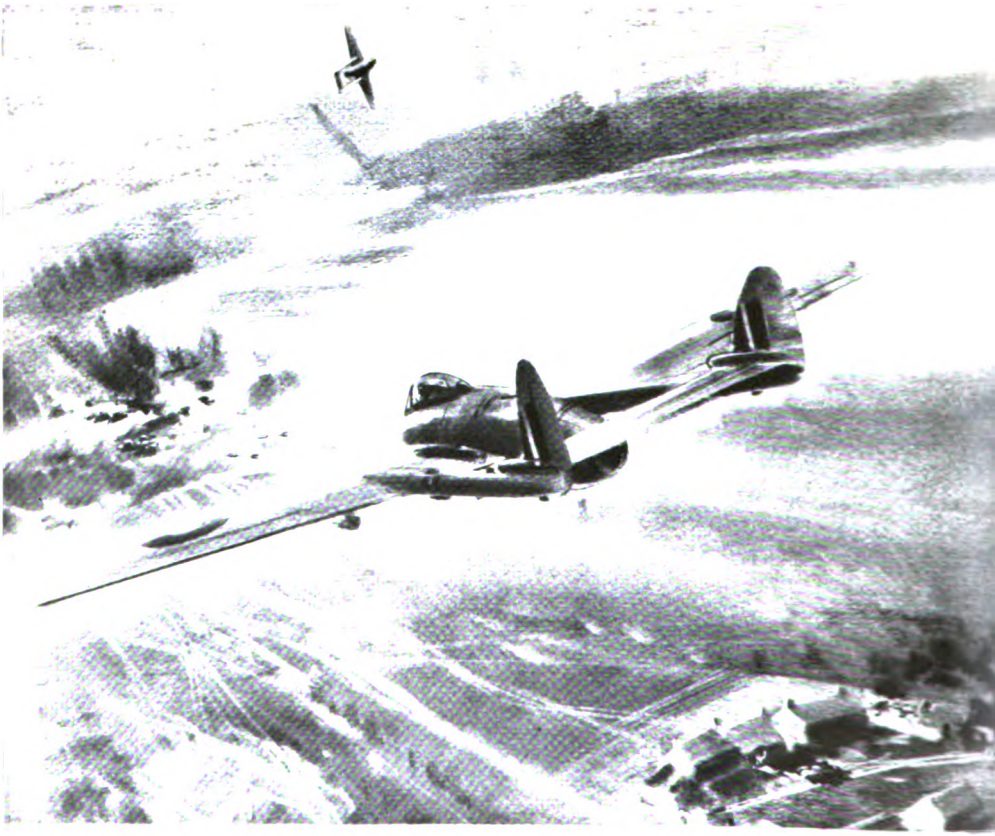

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The views expressed in this Journal are those of the authors, and are not to be construed as official opinions or policies.—
EDITOR.

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WILL UNO NOW BE BACKED BY AN ADEQUATE MILITARY FORCE AND GIVE US SECURITY?

OR—
WILL LACK OF ADEQUATE DEFENCE FORCES LEAVE US OPEN TO SUCH DEVASTATION AS THIS?

*(Without apology we republish the above two pictures which, with similar captions, appeared as our frontispiece nearly two years ago.—*EDITOR)

EDITORIAL

THE INTERNATIONAL SITUATION

EVEN the most optimistic student of international affairs would hesitate today to suggest that the tension between the Western Powers and the U.S.S.R. has lessened. Visualized as a tug-of-war, we might say that, after a faltering start, we have now settled down to take the strain in real earnest, in the hope of recovering much valuable ground lost earlier.

Much can be learnt from studying the events in Korea that might save us from similar unpreparedness in any similar aggression in the future. It is vital to our survival that we should profit from such a lesson to the utmost, as there is no possible guarantee that the next occasion will not affect us more closely or that it will not be on a scale that will make the Korean war an insignificant affair. We have seen once again that the aggressor always has the advantage, at least in the beginning, particularly when intelligence is lacking of his intentions, or when well-founded reports of threatened attack are treated as "war-mongering" and preparations to meet it are made too late or are insufficient.

The attack of the Red Koreans on the south of that country reminds us of the attack on Poland or that on Pearl Harbour. It would almost seem that our earnest desire to keep out of war leads us into allowing our actions to be governed by wishful thinking, which eventually causes us to be late off the mark every time, to lose the first battle and suffer the sacrifices which that entails, possibly with the somewhat smug belief that we always win the last battle.

Latterly we have been hearing so much about the atom bombs, hydrogen bombs, guided missiles and push-button warfare, all claiming that each has the whole answer, that we have forgotten that it is still men who fight, not weapons.

Korea has shown that warfare is still the combat of the individual grouped with other individuals, armed with the rifle, automatic guns, mortars and tanks. It indicates that war still takes the same form of infantry supported by armour, tactical aviation, artillery and strategical bombing.

Once again we are to see proof that victory cannot be won until command of the air has been gained and can steadily be maintained. Without our air superiority it is certain that the United Nations would have suffered a second Dunkirk.

Our precarious foothold, after a stubbornly fought retreat, was for some time a cause for grave anxiety, but as belated support eventually arrived the situation eased somewhat, and the effects of command of the sea and air, plus extensive strategic bombing, began to become apparent. Our assumption of the offensive on the ground and especially the landing behind the Red Koreans and attack on Seoul have now placed a different complexion on this campaign. Although interest at the moment is chiefly centred on Korea, events are moving so swiftly in international affairs that momentous changes many occur in the situation overnight. If we confine our observations to what is factual at the moment, by the time our Editorial is read in three to four weeks' time they may be considerably out of date and our conclusions appear unsatisfactory. Not having the gift of clairvoyance, or the uncanny foresight of H. G. Wells or Jules Verne, it is with some diffidence that we venture to peer into the future. If we must speculate, we are inclined to believe that we are about to achieve our aim and drive the aggressors out of the country they have overrun. If this assumption is correct, is Russia going to remain inactive while the United Nations' forces drive their "fellow travellers" out of South Korea, and what is going to happen if in the

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essential needs of complete victory they carry the war into North Korea? This is even more speculative.

Much has been said in the parliaments of western nations and elsewhere as to the doubt of the present localized fighting developing into a third world war, when this aggression is successfully repelled. Our own first-hand information from Russian sources is that once we are into October the chances of Russia going to war this year are remote. She prefers to begin a war after gathering in her harvest and not until she is through the winter.

As we see it, the situation which now exists, while still manageable, is, nevertheless, extremely grave. Hitherto Russia seemed to be planning for a test of military strength some time about 1952, or even later, and in the meantime was undermining her future opponents by her "cold war" and infiltration of communism by propaganda and utilizing economic depression wherever it appeared. Has she realized that her hopes of an economic crisis and consequent political chaos in the more powerful western nations are not materializing?

If we are correct in our assumption, what advantage would Russia gain by striking now, in circumstances less favourable than those she had planned? Despite her indisputable military strength at the moment, it is insufficient to destroy America's greater war potential, and if she failed to do so at the beginning, she would eventually be defeated.

It is interesting to consider what will happen if she waits. America and the other western nations, now thoroughly alarmed, are at last feverishly and earnestly preparing for the war which threatens them. By 1952 their power to resist will be considerably greater than it is now, their machines of war will be far more modern and in advance of the great proportion of those now held in readiness by Russia, and they will have more fully trained men under arms.

In our considerations we must allow for the likelihood of Russia altering the adverse balance of atom bombs by accumulating a larger stock-pile than she has at present, and this fact may well act as a deterrent to discarding her earlier plan and acting prematurely, realizing the risks of such a course to her hoped-for conquest.

From such facts as are generally known it would seem that Russia will endeavour to gain more time, but she will be governed by circumstances and only postpone military action if she can continue to gain more strength herself and weaken her opponents by her hitherto only too successful methods of propaganda and economic disturbances caused by it among the western nations.

In conclusion, we are convinced that the only possibility of the world being saved from a war more terrible than those which we have survived, is a political upheaval in Russia, which chance is so remote that it behoves us all to prepare earnestly and with what speed we may in the short time left to us, to face this coming struggle with the strongest defence forces that our national economy can provide. In this at least we must be united. The all-out effort must be made now. Tomorrow will be too late.

BUILD UP SPEEDILY OUR DEPLETED DEFENCE FORCES!

As we write, the need for swift action and the reality of our danger seems to have spread at last beyond our editorial columns and the opinions of those in the Services who have unceasingly pointed out the ever-increasing urgency of bringing our depleted forces up to the maximum strength that our national economy will allow, even at the expense of other national necessities and the curtailment of an advance in our standard of living.

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We cannot do better than quote from our Editorial, "Peace or War," written in November, 1948, and published in the R.A.F. QUARTERLY, January number, 1949, as the action we advocated then (nearly two years ago) is that which we still hope to see put into operation:

"PEACE OR WAR

"Tension in the international situation has shown but little change. Russia still passionately desires influence and the spread of Communism; the Western Powers are equally ardent in their wish to continue their own democratic way of life, **and undoubtedly would fight rather than surrender their freedom.** *. . . it is therefore imperative for the Western Powers to build up their operational defence forces, at least to a strength which compares more favourably with those of Russia than they do at present. . . ."*

"The main burden of preserving the security of the Western Powers, particularly in Europe, will rest squarely on the operational striking force of the **Air Arm.** *Recently there have been encouraging signs that this is appreciated by the British Government, but the urgency of the matter must excuse our impatience at the slowness of their action at a time when our continued existence is in dire peril. The whole nation looks to our Government to keep us out of war by providing the Royal Air Force, without further delay, with sufficient trained* **skilled personnel,** *material and productive capacity to back up an air effort that might at any moment be called upon to maintain a stupendous air war. This might call for an adjustment of our economic life, as without economic strength it would be impossible to maintain an adequate military strength to deal with the present situation. Readiness is strength:* **Are we ready for likely eventualities?"**

In that Editorial of nearly two years ago we made suggestions as to what was wrong with our Royal Air Force and suggested immediate action to remedy it:

"THE ROYAL AIR FORCE

"If reliance for peace is first and foremost to be placed upon the strength and efficiency of the Royal Air Force, then there will have to be an immediate improvement in the number and quality of personnel recruited **for the Regular R.A.F.**

"Apart from the urgent need to change the present recruiting system, the conditions in the R.A.F. will have to be made far more attractive than they are at present.

"One of the main causes of poor recruiting is the unpopular new pay code which the Services were reluctantly compelled to accept in 1946. It deterred a large number of the best of our officers from remaining in the Air Force and an even greater number of highly skilled mechanics from re-engaging for an extended period of service. Many of these airmen considered that their position under the new pay code was so bad, and compared so unfavourably with that of trade unionists, that it was not fair to them or their wives and children to ask them to remain in the R.A.F.

"If that was the impression in 1946, how much worse it is now can be assessed by the many increases in pay in civilian occupations since, and the fact that it is unbelievable that skilled men will be content to serve in the R.A.F. at far lower rates of pay than those in comparative trades in civil life. The fact that there are advantages which all men enjoy must be taken into consideration when

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assessing their rate of pay, but against this must be weighed the many disadvantages of Service life, the type of accommodation, service restrictions, frequent moves and separation from families by overseas postings. . . .

"It is a complex and difficult problem, which might be solved to some extent during the present crisis by returning nearer to war conditions with large numbers of women in industry, and a return of war-time concessions to the Air Force with better pay, which would attract those replaced in civil industry by women to rejoin the Royal Air Force.

"As with airmen, so with the officers, pay and conditions are not today sufficiently attractive, and this is especially the case of married officers.

"There is urgent need for immediate action to remedy these matters without delay to enable this country to have behind it at the conference table an air force of sufficient strength and efficiency to add some weight to its deliberations."

WE AWAKEN TO REALITIES

Since the publication of that Editorial in the January, 1949, number of our JOURNAL there has been noticed an awakening to realities in the Western World.

In the British Press have appeared large headlines—**100,000 British Miners Cable to Stalin: "Stop the War."** Recently Parliament was recalled (to deal with urgent questions of defence and to decide on pay increases for the Services).

Air Chief Marshal Sir Guy Garrod, Chairman of the Air League of the British Empire, issued a grave warning regarding the serious deficiencies in our air defences, at a time when the international situation was rapidly deteriorating. "The R.A.F. and its auxiliary forces must be strengthened at any cost and **without delay,"** he said. He drew attention to the inadequacy of the allotment to our defence out of a £3,000 million budget. He further commented on the fact that the Royal Auxiliary Air Force and the R.A.F. Volunteer Reserve were 75 per cent. below target strength, and that the serious aspect of this was that they included the volunteers to man fighter control units.

Summing up his view of the situation, he spoke only too plainly, by declaring that which many of us have hitherto refrained from admitting. So far as the R.A.F. was concerned, we were not prepared to deal with any emergency which might arise in the foreseeable future.

Those of us who have intimate knowledge of Service affairs know full well that these are not "gloomy forebodings" or "pessimisms," but a disclosure of stark realities.

Being still a free people and not a police State, we are permitted to freely draw attention to matters of public interest; by doing so often enough we shall see an awakening of "public opinion." Once awakened, "public opinion" is a fast worker and we shall see a united nation pressing feverishly forward in preparations for its adequate defence should the necessity arise, despite fervent hopes that something at present unforeseen may yet arise to give us peace.

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V.Cs. OF THE AIR

FLIGHT LIEUTENANT DAVID SAMUEL ANTHON LORD, V.C., D.F.C.

BY KENNETH HARE-SCOTT*

I HAVE written close on 100,000 words on V.C. winners of the Second World War, and in preparation have formed a clear idea where each personality stands. David Lord, to my mind admirably exemplifies Britain at war; the great middle stratum of British manhood which is both our characteristic middle and our mass. An ordinary boy from an ordinary home, with all the ordinary enthusiasms, and a little more than average filial devotion. That was Lord.

I am going to tell his story back to front because it is more interesting to have the climax in mind when looking into the past.

Early in September, 1944, the British Second Army was pushing into Holland. At home, the 1st Airborne Division was told to stand by—for the seventeenth time since the Normandy landings. Somehow the men with the red berets and pilots of the R.A.F. who were to carry them into action knew that this was the real thing, and an atmosphere of hustle and preparation, an air of expectancy reigned upon the several airfields from which the operation was to be launched. A few days later General Montgomery called for an airborne carpet to be laid in advance of his Army, one end at Eindhoven and Nijmegen and the other twelve miles deeper into enemy territory at Arnhem.

David Lord had for some weeks been an instructor and pilot attached to Airborne Forces. In August of 1944 he was towing Horsa gliders at 300 feet, and then at 1,000 feet in practice "lifts," and towards the end of the month he and all at Down Ampney, his airfield, were "sealed" for the pending operation.

Early September saw final preparations completed—checking supplies, loads, equipment—all the last-minute adjustments for an air-lift on a gigantic scale. In Gloucestershire, units of the Divisional R.A.S.C., lately trained in air-dispatch duties, had built dumps containing thousands of tons of petrol, ammunition and food—the supplies which were to be dropped in panniers and containers to sustain the ground forces. Lord had done resupply by air missions in Burma, but never on a scale of this approaching operation, in which Army and R.A.F. joined hands in the hope of winning a great battle for the bridge across the Rhine at Arnhem. His job was to tow a glider carrying men of the Air Landing Brigade to the battle area, cut them adrift, and return to carry supplies over on the succeeding days. He was one of scores of pilots and crews of the R.A.F. similarly engaged.

Last-minute changes in his crew, which had flown with him for some time, brought him Pilot Officer King and Pilot Officer Medhurst, son of the Air Chief Marshal, who joined Lord at his own special request and became co-pilot.

The operation was launched on 18th September in clear, sunny weather. Hearts were stout as the great armada heaved across the Channel, and many thousands of people in Southern England on that Sunday morning offered up a prayer for the safe and glorious fulfilment of the enterprise. The pilot of the glider towed by Lord's Dakota says: "We owe our lives to his determination to press on. Through most of the journey a faulty starboard engine made things difficult.

*Author of *For Valour* (published by Peter Garnett).

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Flight Lieutenant D. S. A. Lord, V.C., D.F.C.

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His words of encouragement on the inter-communication to my glider helped me and my second pilot to accomplish a very difficult trip." Over Arnhem he released the glider and turned for home.

Of greatest importance to the success of the operation was to be the question of supplies. I will not dwell upon the ground fighting in detail in this article. Suffice it to recall that the 1st Airborne Division, lifted in two halves on successive days because priority in aircraft availability had to go for the American landings at Eindhoven and Nijmegen, ran into terrific opposition which was as unexpected as it was vigorous. In fact, a Panzer Corps refitting in the area, when it recovered from its surprise, swept into the scattered Airborne Division until finally held at bay by that indomitable thin red line of the perimeter which shrank but never gave up. Eventually, contact was made by the survivors, about one-fifth of the original force, with the spearhead of the Second Army, and the miraculous escape followed.

Daily, supply-by-air missions left the Gloucestershire airfields. Convoys of lorries carried panniers and containers alongside each plane, and R.A.S.C. despatchers, who were to accompany the R.A.F. to push the panniers out at the right spot, loaded them up, checked parachutes and tackle, stood by for briefing. Such was the procedure on 19th September before the first resupply formation headed across the English coast.

In contrast to the previous day it was dull, and in bad visibility the formation became scattered. Lord found himself forced to navigate individually until he turned north towards Arnhem from Lille; then he rejoined the rest of his formation heading in the same direction. In better visibility they crossed the Dutch frontier—and immediately ran into trouble, which I shall let Pilot Officer King, a member of Lord's crew, describe:

"Some four miles before crossing the river at Arnhem we were hit twice, one of these hits being on the starboard wing. David immediately inquired of each one of us if we were O.K. No one was hit or hurt and David announced that as it was imperative the Army had the stuff, he was going in, especially as we were so close to the dropping zone. We were then three minutes' flying time away from this dropping zone.

"Shortly after Dave said this, I heard him give Dickie Medhurst instructions what to do as the starboard motor was on fire. We went over the dropping zone and dropped our stuff. As we were dropping, David suddenly yelled like a mad thing for us to bale out. The last words I ever heard him say were: "Bale out; for God's sake, bale out."

"I fixed my 'chute and passed quickly to the rear of the plane. The last of the load was then leaving the plane. I helped Alec Ballantyne, the wireless op., to fix 'chutes on the Army dispatchers. Alec was very calm and said, 'You go now, Harry, as these fellows won't go till they see one of us go.' I turned towards the open door and in so doing saw Dickie Medhurst coming down the plane. He had his 'chute on and I gave him the 'thumbs up' sign. He returned it. The next thing I knew was I was out of the aircraft, and I felt sure someone had pushed me.

"I don't remember pulling the ripcord, but after only a few seconds I landed flat on my back. I lay there very much winded when I realized someone was shooting at me. . . . I crawled into a farmyard some fifty yards away."

Later he met some Paratroops. "They stated they saw us come in burning like a torch and drop the supplies. . . . Words failed them as they tried to express what they thought about us coming in to drop supplies despite being in flames. . . . David personified in this last trip the spirit that beat the Hun; he enhanced the confidence in the R.A.F. which we had to inspire in the Paratroops. After

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Flight Lieutenant David Lord, V.C., D.F.C., and brother officers in the Far East

Arnhem those Paratroops would fight anyone who ran the R.A.F. down," writes King.

On 13th November, 1945—fourteen months after the operation—when all hope of his return was abandoned, the award of his posthumous V.C. was announced. The official citation of this first award of a V.C. to Transport Command of the R.A.F., amplifies King's account:

"Flight Lieutenant Lord came down to 900 feet, where he was singled out for the concentrated fire of all the anti-aircraft guns. On reaching the dropping zone he kept the aircraft on a straight and level course while supplies were dropped. At the end of the run, he was told that two containers remained.

"Although he must have known that the collapse of the starboard wing could not be long delayed, Flight Lieutenant Lord circled, rejoined the stream of aircraft and made a second run to drop the remaining supplies. These manœuvres

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took eight minutes in all, the aircraft being continuously under heavy anti-aircraft fire.

"His task completed, Flight Lieutenant Lord ordered his crew to abandon the Dakota, making no attempt himself to leave the aircraft, which was down to 500 feet. A few seconds later the starboard wing collapsed and the aircraft fell in flames. . . .

"By continuing his mission in a damaged and burning aircraft, descending to drop the supplies accurately, returning to the dropping zone a second time, and, finally, remaining at the controls to give his crew a chance of escape, Flight Lieutenant Lord displayed supreme valour and self-sacrifice."

David Lord was born on 18th October, 1913, at Cork. His father was a Warrant Officer in The Royal Fusiliers and inevitably completed his tour of overseas service—in which his family accompanied him to Malta and India—before rounding off his regimental service at Wrexham, where he and his wife live today. Glimpses of David the boy reveal him going to the Convent School in Lucknow in a bullock cart, hurrying home in the evenings for a game of cricket with the cook's two sons and the family dog; an incident with father's batman, when, his parents having gone to a theatre, David was left with the servant, whom he let into the secret of where father kept his "tonics," and aided and abetted the man to a state of drunken somnolence; and, in Wrexham, playing battery commander with the guns on the barrack square and getting father into an awful lot of trouble when they were found facing in all directions to repel invasion!

He was brought up a Roman Catholic, and remained devoted to his religion throughout life; even in the discomforts and distractions of service in Burma he never failed to commune regularly with his Priest. At the age of 14, while at school, he decided to study for the Priesthood, and, in time, from St. Mary's College, Aberystwyth, he matriculated at the University of Wales, and proceeded to the English Ecclesiastical College at Valladolid, in Spain.

Fond of games and possessed of normal enthusiasms, he easily made friends; he was especially devoted to his parents and took much pride and pleasure in making happy those he called "my three" (mother, father and younger brother). His letters home during the war reflect the comfort and inspiration he found in his completely satisfying background.

After two years in Spain, he decided that, after all, he had not found his vocation in the Church. He returned home to admit his decision and measure life afresh as an assistant in a firm of pharmaceutical chemists. (Today his photograph hangs in the office bearing the simple inscription, "David.") In spare time he began writing short stories; I read one not long ago, published in a volume called *Tales of Death*. It was an exciting story, written by the promising student of fiction rather than the master. Several stories were published, and with the arrival of each cheque a tremendously excited young man would rush round the house waving the precious piece of paper until everyone knew about it. In the flush of success he packed his trunks and caught the train to London in 1936 to try his luck as a free-lance journalist. But not for long. First, Sir Alan Cobham's Air Circus and then the possibility of a career in the R.A.F., pulled him away from what was, after all, only a hobby; and within a few weeks he began his training at Uxbridge and Hamble.

His first solo flight came in October, 1938, and two months later he qualified as a pilot with an "average" mark. Not good enough (he gave up smoking cigarettes in the belief that they affected his eyes), but it was a beginning which sent him to war the following year, well placed to be of immediate service.

With 31 Squadron he went to India to become engaged in a long and varied

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Flight Lieutenant David Lord, V.C., D.F.C., and brother officers in the Far East

Arnhem those Paratroops would fight anyone who ran the R.A.F. down," writes King.

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"Although he must have known that the collapse of the starboard wing could not be long delayed, Flight Lieutenant Lord circled, rejoined the stream of aircraft and made a second run to drop the remaining supplies. These manœuvres

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took eight minutes in all, the aircraft being continuously under heavy anti-aircraft fire.

"His task completed, Flight Lieutenant Lord ordered his crew to abandon the Dakota, making no attempt himself to leave the aircraft, which was down to 500 feet. A few seconds later the starboard wing collapsed and the aircraft fell in flames. . . .

"By continuing his mission in a damaged and burning aircraft, descending to drop the supplies accurately, returning to the dropping zone a second time, and, finally, remaining at the controls to give his crew a chance of escape, Flight Lieutenant Lord displayed supreme valour and self-sacrifice."

David Lord was born on 18th October, 1913, at Cork. His father was a Warrant Officer in The Royal Fusiliers and inevitably completed his tour of overseas service—in which his family accompanied him to Malta and India—before rounding off his regimental service at Wrexham, where he and his wife live today. Glimpses of David the boy reveal him going to the Convent School in Lucknow in a bullock cart, hurrying home in the evenings for a game of cricket with the cook's two sons and the family dog; an incident with father's batman, when, his parents having gone to a theatre, David was left with the servant, whom he let into the secret of where father kept his "tonics," and aided and abetted the man to a state of drunken somnolence; and, in Wrexham, playing battery commander with the guns on the barrack square and getting father into an awful lot of trouble when they were found facing in all directions to repel invasion!

He was brought up a Roman Catholic, and remained devoted to his religion throughout life; even in the discomforts and distractions of service in Burma he never failed to commune regularly with his Priest. At the age of 14, while at school, he decided to study for the Priesthood, and, in time, from St. Mary's College, Aberystwyth, he matriculated at the University of Wales, and proceeded to the English Ecclesiastical College at Valladolid, in Spain.

Fond of games and possessed of normal enthusiasms, he easily made friends; he was especially devoted to his parents and took much pride and pleasure in making happy those he called "my three" (mother, father and younger brother). His letters home during the war reflect the comfort and inspiration he found in his completely satisfying background.

After two years in Spain, he decided that, after all, he had not found his vocation in the Church. He returned home to admit his decision and measure life afresh as an assistant in a firm of pharmaceutical chemists. (Today his photograph hangs in the office bearing the simple inscription, "David.") In spare time he began writing short stories; I read one not long ago, published in a volume called *Tales of Death*. It was an exciting story, written by the promising student of fiction rather than the master. Several stories were published, and with the arrival of each cheque a tremendously excited young man would rush round the house waving the precious piece of paper until everyone knew about it. In the flush of success he packed his trunks and caught the train to London in 1936 to try his luck as a free-lance journalist. But not for long. First, Sir Alan Cobham's Air Circus and then the possibility of a career in the R.A.F., pulled him away from what was, after all, only a hobby; and within a few weeks he began his training at Uxbridge and Hamble.

His first solo flight came in October, 1938, and two months later he qualified as a pilot with an "average" mark. Not good enough (he gave up smoking cigarettes in the belief that they affected his eyes), but it was a beginning which sent him to war the following year, well placed to be of immediate service.

With 31 Squadron he went to India to become engaged in a long and varied

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tour of transport duties, ranging from dropping supplies to Chindits and evacuating wounded to carrying mail. Five or six missions on successive days appear in his log book, as also as passengers both the Maharajah of Baroda and his luggage, and General Wavell.

After a succession of supply drops to Wingate's Chindits in 1942, Lord was awarded the D.F.C. He had, in 2,500 hours' flying, attained the standard he had set for himself when that word "average" accompanied his qualifying mark as a pilot. Now his Squadron Commander rated him "exceptional" as pilot and "above average" as navigator. To his crew and friends he was known as "Lummie" Lord because, a friend says, "if and when he was at all irritated or annoyed at anything, he would give vent to his feelings with 'lummie' instead of one of the variety of other strong expletives we humbler beings employed." At the time of the Burma operations, the Brigadier in charge of supply dropping described him as "the best pilot we have on the job."

An incident during the evacuation of Burma is worth recalling. A fairly senior Army officer wished to take a sack of rupees with him. Lord had issued an order that his aircraft would take no man wearing more than his trousers (he and his co-pilot had already made flights with babies on their laps!) The officer insisted, so Lord left him behind for a later trip, when grudgingly and threatening action in high quarters, the soldier stepped aboard dressed to Lord's specification. When he did complain, the senior R.A.F. officer listened attentively, and then rapped out, "You are lucky it was 'Lummie' Lord who was the pilot. Had it been me I should have b—— well shot you and saved time!"

In all, he spent four years in India and Burma before returning in 1944 to join 271 Squadron to prepare for airborne operations in Europe—culminating in Arnhem.

He lies buried today in Arnhem Cemetery beside two of his friends, Alec Ballantyne and "Dickie" Medhurst. His parents are rightly proud of a letter which Marshal of the Royal Air Force Lord Portal sent them when David's death was beyond all doubt:

"I have read of many great deeds for which the Victoria Cross has been awarded, but I do not remember one which surpassed in gallantry the action of your son. The whole of the Royal Air Force will, I know, share my admiration and will be deeply sensible of the honour your son has brought to the Service. . . . His gallantry and sacrifice will have an illustrious place in the annals of the Royal Air Force."

In Wrexham Cathedral a shrine of the Immaculate Conception contains a beautiful oak kneeler and oak pedestal bearing this inscription:

"Of your Charity, please pray for the soul of Flight Lieutenant David S. A. Lord, V.C., D.C.F., R.A.F. Killed in action at Arnhem, 19th September, 1944. Formerly an altar server in this church."

David Lord died in circumstances which made a battle pause as friend and foe drew breath in admiration.

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KOREA AND AGGRESSION

By Dr. J. M. Spaight, C.B., C.B.E.

THE LESSONS OF KOREA

THERE are military lessons in plenty to be learned from the fighting in Korea, but this article does not deal with them. Its purpose is to draw attention to one tremendous fact of international significance that has emerged and to one general conclusion that belongs to the realm of statecraft rather than of strategy. The tremendous fact is that we know now that if Communism strikes, if it passes from cold war to shooting war, the United States will march to the sound of the guns. That will affect the whole outlook for world peace. The general conclusion is that the events at Lake Success and in Korea have demonstrated the pressing need for a Pacific Pact on the lines of the North Atlantic Treaty of 1949. The second of these two matters will be dealt with first.

It is true that the machinery of the United Nations Organization worked not ineffectively, in the absence of a Pacific Pact, in the Korean affair. That was a piece of good luck. It might not have worked at all. It so happened that in June, 1950, the Soviet Union was staging a boycott of the Security Council, the reason being that a representative of the Chinese Nationalist Government was still sitting as a member of that body, on which the Russians contended, he should have been replaced long since by one from the Communist Government at Pekin. The result was that no Russian representative was present when the Korean crisis came up for consideration. Had one been present there is little doubt that by interposing the veto he would have blocked the resolution authorizing sanctions against Northern Korea. It would have been just one further instance to be added to the many in which Russia has thrown that particular spanner into the works of the international authority.

THE GREAT POWER VETO

From the first the Great Power Veto has been a nuisance; that it was a regrettable necessity has always been acknowledged. The effect of it was to exempt the Great Powers from the provisions of the Charter in regard to sanctions. In truth, to have provided for the use of force against such a Power would have been to conceal a delayed-action bomb in the new structure of world peace. That has been appreciated from the earliest days of the Organization. "What would happen," asked Mr. Stettinius in a broadcast from San Francisco on 28th May, 1945, "if one of the Council's five permanent members"—that is, a Great Power—"embarked upon aggression and refused to recognize the machinery of the world organization? In such an event the answer is simple: another world war has come, vote or no vote, and the world organization has failed."

Mr. Ernest Bevin said in the House of Commons on 25th August, 1945: "The situation is that the Great Powers have not taken obligations under the Charter to inflict sanctions on each other. They have taken this course because such sanctions would mean a major war, in which the United Nations Organization as at present constituted would inevitably perish. . . If the Great Powers cannot be reasonably true to the promises which they have made in the Charter, no promise to inflict sanctions upon each other will save the world."

THE VETO MISUSED

The position under the Charter is thus that the Great Powers are pledged to do voluntarily that which other Powers could be forced to do—unless (see later)

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a Great Power interposed its veto—and to settle their disputes without resort to war. They were regarded as the big boys, the prefects, of the international school, and could be trusted to behave themselves; the others might not and would have to be caned. To have made them subject to the rule of force would have been, in any case, an empty gesture. The framers of the Charter were in this respect realists. They did not provide for the impossible, that is, for the imposition of restraint where restraint was not practical politics. Actually, however, what they did had a result not contemplated by them.

They did not foresee that Russia would surround herself with a ring of satellite States of enforced Communist ideology. These States could in her eyes do no wrong. That became evident first when she backed up Albania through thick and thin in the dispute with Britain about the mining of the Corfu Channel. The result of her action in this and other cases was to upset the applecart of the United Nations Organizations. It became abundantly clear that not only Great Powers but minor States, provided they were Russian satellites, were to all intents and purposes exempt from the Charter provisions in regard to sanctions.

Russia has not had the least compunction about making use of the veto in and out of season. The success of the new international system depended upon this particular pedal being used sparingly and with a light touch. Russia has banged it down incessantly. By her use of it she has reduced the United Nations Organization to virtual impotence. The Security Council has been prevented by her from fulfilling the role for which it was appointed. To put the matter vulgarly—and appropriately—she has cocked a snook at the international authority she helped to establish.

THE KOREAN AFFAIR

Possibly the Kremlin regretted that it was not on the spot (through its own action) to carry on its work of obstruction when Korea came up for consideration at Lake Success. The United States motion calling on member States to support South Korea was carried by seven votes (United States, United Kingdom, France, China, Cuba, Ecuador and Norway) to one (Yugoslavia), which gave the requisite majority. (The representatives of India and Egypt did not vote; they were awaiting instructions from their Governments; later, India concurred in the majority vote but Egypt dissented.) The Kremlin, in a Note to the United States, contested the legality of a decision taken in the absence of two permanent members of the Council—the Soviet Union and the "true" China. As against this argument, Mr. S. R. de la Mahotière pointed out in a letter to *The Times* of 4th July, 1950, that the Security Council had made decisions in other cases without the concurrence of all five permanent members, the most notable being in regard to Persia in 1947, Palestine in 1948 (May, July and October) and Kashmir in 1950 (March), and in none of these instances did Moscow challenge the validity of the decision. The framers of the Charter could not have intended that the Security Council should be paralysed by the refusal of any of its members to take part in its proceedings. The validity of the Security Council's resolution was defended by Mr. Attlee in the House of Commons on 5th July on similar lines. A practice had grown up, he said, that if a permanent member of the Council abstained from voting, a resolution was still regarded as legally effective and not invalidated by the fact that the Power in question had not cast its vote in favour.

Whether the action taken by the United States in ordering air and naval forces to support the South Korean Government *before* the Security Council had approved the giving of aid was in strict conformity with the Charter is a question

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upon which differing views may be held. It was certainly within the spirit of Article 51 of that instrument. This Article safeguards a member State's "inherent right of individual and collective self-defence" in the event of armed attack, until the Security Council has taken the necessary measures for protection. The Charter, said Mr. Attlee in the House of Commons on 5th July, had not taken away "this inherent right," and the Powers which were parties to the North Atlantic Pact had recognized that it applied to the case of aggression against other nations like Italy and Portugal who were not members of the United Nations. "The broad principle," he said, "was that all States might be endangered if the aggressor was allowed to get away with the fruits of aggression in any part of the world." The principle in question would be sufficient to justitfy the action taken by the United States; though not a member of the United Nations, the Korean Republic was created by them, and it would be pedantic formalism to hold that, having established it, they were bound to stand aside while it was being swept out of existence. And if the Security Council was thus concerned in the protection, the rendering of aid for the kind of *ad interim* defence contemplated in Article 51 could not be considered a departure from the spirit of the Charter. The argument that what is intended in Article 51 is aid furnished under a regional pact is a distinctly challengeable one. "Collective defence" does not cease to be such because there has been no prior agreement providing for it. It must be admitted, nevertheless, that the position would have been clearer if a Pacific Pact (on the lines of the North Atlantic Treaty, and with the United States as a party to it) had been in existence. No doubt the incident will accelerate the movement for the conclusion of such a pact.

REGIONAL AGREEMENTS

It was fortunate, in a way, that Moscow was boycotting the Security Council just at the time of the Korean incident. On a future occasion of the same kind a Soviet representative may be in his place and action by the Council may be blocked. Some escape from the stranglehold of the veto is essential if the new system is really to safeguard peace. It is, indeed, generally recognized already that, because of it, the Charter is by itself an insufficient shield, and that is why the States of the western world have been trying to seek security along the alternative route contemplated in that instrument. There are two routes which it recognizes. The main one is that sign-posted by the Security Council, and this was intended to be the normal one. The other is the segmented and subsidiary route which seeks the same goal through a series of special arrangements for collective defence, organized on regional lines. Three important arrangements of this kind have already been made. The first is the Inter-American Treaty of Reciprocal Assistance signed at Rio de Janeiro on 2nd September, 1947. The second is the Brussels Treaty signed on 17th March, 1948. The third is the North Atlantic Treaty signed on 4th April, 1949. In none of these treaties is there any provision for a Great Power veto. All the parties stand on an equal footing. There is, therefore, a better assurance of aid in need than there is under the Charter, the machinery of which can be thrown out of gear by a single vote. There is, *per contra*, a diminution in the volume of promised aid, the circle of guarantors being smaller. That the advantages are considered to outweigh the disadvantages is evident from the fact that so many States which are members of the United Nations have thought it advisable to reinsure themselves by means of such special agreements.

DECENTRALIZED FIRE-FIGHTING

The agreements are "within the framework of the Charter" and each of

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them will serve, it may be expected, as the devolved authority within the area concerned for action designed to attain the objects of the principal instrument. The Charter itself will be utilized, too, no doubt, in favourable circumstances, but normally the regional pacts will be relied upon for the safeguarding of peace in the various parts of the world in which they are operative. Will they avail to avert war? Possibly not. What they will do, probably, is to localize minor wars and to bring them to an end before very much harm has been done. If they can succeed in doing this they will go far to prevent major wars, too, for these may develop out of quite petty conflicts. There must always be a danger of that. It was very much in everyone's mind during the Korean fighting, which might well have ended in a world war. The more small wars can be cordoned off and shortened, the less likelihood is there of a major war supervening. The locally organized league will serve as a fire-brigade which, by prompt action within its limited sphere, will prevent a prairie fire from sweeping over the world.

Geographically delimited pacts are not altogether ideal for Powers which have world-wide interests. For them, a general pact without any geographical limits and open to all nations which would undertake obligations for mutual assistance analogous to those contained in the existing regional agreements would be preferable. If Russia should resign from the United Nations, taking her satellites with her, or if she were expelled, as she was from the old League of Nations, it is conceivable that the Charter would either be amended or be supplemented by a protocol enabling such a general pact to be concluded. If Russia remains (nominally) a member of the United Nations, no modification of the Charter would be possible, and the regional pacts would have to be continued and added to instead of being merged in one global pact.

THE CHANGE SINCE 1939

The one tremendous fact which has changed the whole international situation from that which existed before 1939 is that the United States is now in the fight for collective security. Nothing else matters in comparison with that. American isolationism is dead and gone. The change that has come about can be appreciated if one compares the reaction of the government at Washington to the Communist invasions of Finland in 1939 and of South Korea in 1950. On 1st December, 1939, President Roosevelt issued a statement deploring the Russian attack on Finland. "It is tragic," he said, "to see the policy of force spreading and to realize that wanton disregard for law is still on the march." It was confidently expected that American aid for Finland, at least in the form of "measures short of war," would follow these grave words. But nothing of the kind was done. The failure of the United States to assist Finland in any way was the cause of bitter disappointment in that country, where even isolationists were in favour of American action. The President's internationalism, says Professor Rauch, sincere as it was, did not blind him to "the practical necessities of power relationships."[1] In other words, he wanted to keep on the right side of Russia, and perhaps in all the circumstances he was wise in his generation.

How different was the American Government's response to the Korean Government's call for help in 1950! There was no hesitation then, no holding back, no thought of appeasement or compromise or power politics. President Truman's announcement on 27th June of his Government's decision to send air and naval units to Korea electrified the whole civilized world. Alike in the United States and in Britain party ranks were closed, political differences laid aside. Democrats and Republicans in Washington, Socialists, Conservatives

[1] Basil Rauch, "Roosevelt: From Munich to Pearl Harbour," 1950, pp. 163, 168.

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and Liberals in Westminster, all were of one mind in this matter. The prompt and unhesitating response of the British Government to the President's initiative was in striking contrast to what had happened in the not very dissimilar crisis of March, 1936, when Hitler marched into the Rhineland; the French Government was prepared to act then as Washington did in Korea, but the British Government held back and temporized. Resolute measures then might have averted the Second World War. There was no such doubt or timidity in 1950. Practically every nation in the world rallied to the American lead.

The lead was all-important. Wars will be fewer and shorter if a Great Power that stands for peace will do always what the United States did in June, 1950. The way to kill war is to jump on it whenever and wherever it shows its head. To say that is not to advocate preventive war. It is simply to state the obvious fact that immediate action is needed if the aggressor is to be stopped before he can go very far, and such action is possible if a Great Power will take it and not otherwise. The Great Power will have to be almost as quick off the mark as the aggressor; it will have to beat the starter and move before the international authority has given the word to go; it is fairly certain to have its action endorsed by the authority if the result is the stopping of the aggression.

THE STOPPING OF AGGRESSION

We must be realists in this matter. Aggression appeals naturally to the rulers of a Communist State. The governance of such a State is based on force and terrorization and not on discussion and consent. There is in it nothing of the spirit of fair play which in a really democratic country dictates that each political party should bat in its turn and that the side which has lost the confidence of the electors should field. In a Communist country there is one team only and its innings goes on for ever; anyone trying to turn it out is liquidated. Naturally, the ruling régime of such a country relies on similar methods in its foreign relations, and being totalitarian it can strike suddenly. It must have its way and begins to throw its weight about if thwarted; becomes, in short, an aggressor. There is no reasoning with such a nation. It is usually politically immature, not broken in to the give-and-take of international politics, ignorant, indeed, of foreign ways, a kind of juvenile delinquent among the nations, and because its cosh may be a 60-ton tank, a really dangerous bully, taking a lot of stopping in spite of its comparative insignificance. The way to stop such a gangster, and to stop him quickly, is not to wait to call the watch together, but for one or two of the bigger and wiser fellows to stand up to him, having taken good care to have a sufficient number of powerful bazookas ready for just such an emergency. The biggest fellow in the world today is Uncle Sam. If he and John Bull—who is a pretty big fellow, too—would face the roaring bully he would soon pipe down. But here, unfortunately, we are up against the constitutional difficulty in the way of prompt action by a democratic country. Its Government must carry the people with it. It has not the freedom of action which a dictatorship has. Nevertheless, even in a free country, it is possible in some circumstances to move quickly and effectively. That was shown by what happened in Korea, and it is a good omen for the future, when the same kind of stopping measures will have been organized, one may hope, well in advance and will be less a matter of last-minute improvisation. Incidentally, the plans that are made to meet external aggression should take account of Communist action *within* each threatened country, too. That is a very real danger. Mr. Dean Acheson showed that he was alive to one variety of it when he stated that the "armed attack" referred to in the North Atlantic Treaty would include "revolutionary activity inspired, armed, directed from the outside."[2] That form

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of "aggression" is a Communist speciality. We had an ominous reminder of the danger of this kind of treacherous warfare in the fire and explosion which wrecked a number of ammunition barges at Portsmouth on 14th July, 1950.

THE DANGER REMAINS

The danger remains. To assume that a great war is now less to be feared because the Russians will draw the necessary conclusion from the stand made by the free nations in Korea is unwarranted. Rather, as *The Times* observed in a leading article on 24th July, the lesson of Korea is that "the whole free world has to brace itself to meet a series of small-scale onslaughts in the immedate future, scattered over the world, rather than (or perhaps as well as) the world-wide challenge in, say, 1953, which had become the basis of some official appraisals of the strategic outlook." Whether a great war is to materialize or not is a question which only the Kremlin can answer. It is possible to quote from Marxist literature passages which assume the inevitability of an eventual clash between the Communists and those Powers which they are pleased to call pluto-democracies, a rather more opprobrious term, apparently, than capitalist. It is equally possible to set over against such forecasts pronouncements by Mr. Stalin and others that the two political systems may very well co-exist peacefully and that they have no need to fly at one another's throats. The suggestion sometimes made that Russia regards herself as the predestined conqueror of the world appears to have a shaky foundation in authoritative Soviet writings or oral declarations. Rather, it seems, she sees her own safety and survival threatened unless she can succeed in converting at least the major part of the non-Russian world to her own not very attractive ideology. In that sense she has a mission to "conquer" the world, a mission that is not necessarily to be accomplished by violent means. The fact remains that the missionary nation is at the same time the most powerfully armed nation in the world. The combination is not reassuring. A war deliberately undertaken in order to spread the Red gospel is less probable, no doubt, than an accidental war resulting from efforts to spread it without fighting; but war is war, however it originates.

In the West there has been and is, assuredly, no desire for war. There is at the same time a very general apprehension that war may come. "If we look about the world," say Mr. John Foster Dulles, "we see warning signals that in the past forecast reliably the coming of war. . . . There should be no illusion about the reality of the danger. It is immense."[2] Even the date of the catastrophe has been predicted with some confidence, a date which varies with the forecaster's estimate of the time which the Russians will need to stockpile atomic bombs in "significant quantities." No responsible statesman in the West has gone on record as saying that there is no danger of war. On the contrary, alike in official statements and in the precautionary actions of the western governments there have been indications of a clear conviction that a third world war is a distinct possibility and that it may break out within a period of time which makes preparations to meet the danger imperative now. The warning that "it is later than you think" has been the substance, expressed or implied, of much that has been said or done by those bearing responsibility for national security in the West. It was the dominant note in the debate in the House of Commons on 26th and 27th July, when Mr. Churchill drew attention to the overwhelming strength of the Soviet forces and the inadequacy of the preparations so far made to resist them. There is certainly no high authority for the proposition that there is no danger of another great war.

[1] Carnegie Endowment Publication No. 451, May, 1949, "The North Atlantic Pact," p. 412.

[2] John Foster Dulles, "War or Peace," 1950, pp. 2, 3.

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BALANCED FORCES AND WESTERN DEFENCE

By Air Marshal Sir Robert Saundby
K.B.E., C.B., M.C., D.F.C., A.F.C.

WHAT is meant by the term "Balanced Forces"? To some people the term may be a new one, and its meaning is not perhaps very self-evident.

In the past, in this country, it has come to mean a carefully worked out allocation of the limited part of our national resources earmarked for defence. The object of this allocation was twofold. First, it was so to balance the various elements of our available forces as to give them the best hope of dealing successfully with any foreseeable trouble within our sphere of responsibility. Secondly, in the event of a major attack on this country, it aimed at providing forces capable of bringing us successfully through an opening defensive phase, and give time for our war potential and that of the Commonwealth and Empire to develop.

If in the past we have had many difficulties, expensive and even disastrous colonial wars, and if in the two world wars we survived the opening phases only by the skin of our teeth, it was not so much because of a lack of proper balance in our forces, but because the total allocation of resources to defence was too small.

In our democracy, which since the days of Queen Elizabeth has not had an aggressive military policy, we have been mainly concerned with the advancement of our commerce, the acquisition of national wealth, and the improvement of our standard of life. Any money spent on defence has necessarily meant a diversion of resources from our main objects, and was therefore resented by all political parties and by almost all shades of opinion. For this reason we never had, and probably never will have, military forces in time of peace which are in the least commensurate with our vast responsibilities. In addition, there has lately been a tendency to widen these responsibilities by undertaking (formerly in the name of the League of Nations, and nowadays the United Nations) to play our part in resisting aggression anywhere in the world.

If we in the United Kingdom were to provide the military forces required for the discharge of these responsibilities, or even for the defence needs of our own Commonwealth and Empire, we should, like Russia, have to gear our whole economy in peace-time to the military machine, and lower accordingly our standard of living. This is the meaning of Goering's phrase "Guns instead of butter."

This country and the free countries of the western world decisively reject this concept. Our Communists and "fellow-travellers" urge us to reject it, on the grounds that if both sides arm war is inevitable. This is, of course, nonsense, and the statement "an armaments race always ends in war" is true only in the same sense as is the phrase "bed is the most dangerous place in the world, because most people die there." But the real reason for resisting it is that life, on these terms, is hardly worth living, and that it is felt to be absurd, and even monstrous, to prostitute the greater part of our scientific knowledge and our energies to the production of weapons of war, or worse, weapons of mass destruction.

And so we naturally look for some compromise, some scheme which will

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give us a bare minimum of security, and allow us to devote as much of our resources as we dare to the Welfare State.

For a long time now we have expected the various parts of the Commonwealth and Empire to share with us, in some degree, the burden of defence. In so doing, we have not urged that each part shall produce, in microcosm, a balanced Navy, Army and Air Force. We have taken note of local conditions, geography, population, and industrial resources. Thus India provided mainly infantry divisions, the United Kingdom provided the main fleets, armoured land forces, and strategic air forces, while the self-governing Dominions added their quotas to the respective Services. Colonial territories, besides providing forces for local defence, raised money for warships and air squadrons, etc.

It was the business of the Combined Chiefs of Staff in London, working in close co-operation with their counterparts in the Dominions, to ensure as far as was practicable that the total resources available, when added together, made up a reasonably balanced defence force. Of course, there might be thin places here and there, and in one or two directions we might seem to be relatively over-insured. As time went on, however, these inequalities got ironed out, and the scheme became better balanced. Its main defect has always been that the total forces available fell a good deal below the minimum required for real security.

For a whole century, from the Battle of Waterloo to the Kaiser's war in 1914, we had no obvious enemy and our fleets were the unchallenged masters of the seas of the world. By well-timed movement of warships we were able to influence national policy almost everywhere, and there existed a sort of Pax Britannica not unlike the Pax Romana of the early centuries of the Christian era. As a consequence, we devoted to the Navy most of the money earmarked for defence, and the Army, as the campaigns in the Crimea, Egypt and South Africa showed, was dangerously starved of resources and neglected. The disasters of the Boer War in South Africa, however, shook the country and a reform of the Army was put in hand. By 1914 this had been completed, and when the war broke out we had a small but highly efficient Regular Army, and a substantial, keen and well-trained Territorial Force. Both Regulars and Territorials suffered from an undue concentration on the rifle and bayonet, with a consequent neglect of automatic small-bore weapons. In spite of that, however, we had a sound, efficient and balanced defence force that, with the help of our Allies, halted the Kaiser's armies, and maintained command of the sea.

In 1918 the Royal Air Force came into being, and thus, by the addition of a third Service, complicated the question of balanced forces. Arguments raged all through the years of peace, and the Air Force, as a new Service, had a hard task to keep its head above water. But by 1935 the great importance of air power, both for Home Defence and for strategic and tactical air operations, was recognized. When war came again in 1939 our forces were reasonably well balanced, but, once again, far too small for the task they had to face.

It is true that during the years of peace some mistakes had been made. Singapore fell largely because a proper balance had not been struck when allocating resources to its defence. A huge sum had been spent on erecting batteries of 15-inch naval guns, instead of providing strong local air forces. This matter had been the subject of an acute controversy between the Services, and had eventually been settled by a special committee, presided over by the Prime Minister of the day, which had declared in favour of heavy guns rather than air forces. This example shows how disastrous in its effects a lack of proper balance in a defence force can be. Without doubt, a similar misappreciation on

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a larger scale could have equally disastrous effects in a vital theatre. What would have happened to us in 1940 had we heeded those (and they were not few or uninfluential) who advocated the suppression of Fighter Command on the ground that "the bomber will always get through"?

Thus, the importance of balanced Defence Forces, made up of components provided by India and a number of self-governing and co-equal members of the British Commonwealth, has long been fully realized. But, since the end of the last war there has been a new and very significant development. The situation has changed, and the free nations are now faced by the world-wide challenge of aggressive Communism. Russia and her satellite puppet states have not disarmed since 1945. They have rearmed, and by every means in their power, short of open violence, they are probing our weak points, undermining and damaging our economy, misrepresenting our intentions and our way of life, and fomenting rebellion and strife everywhere. It is clear that they hate everything about the free world, and intend, if they can, to subjugate it to the rule of the Kremlin and the police state. Negotiation is useless, for you cannot negotiate with a man whose only desire is to murder you. Nothing stands between us and destruction but the strength of our armed forces and our determination to defend ourselves.

It is not therefore surprising that the free nations of the world, under the ægis of the United Nations, are banding themselves together for defence.

There is no longer any possibility of achieving a balance of power in Europe. Russia is far too powerful, too rich in man power and resources, and her economy too deeply enmeshed in an immense war machine. We must therefore think in terms of a world balance of power—once again, in the words of Canning, we must "call in the New World to redress the balance of the Old." And so we have the Atlantic Treaty, an assembly of free nations pledged to support each other and to find armed forces for their common defence. This will circumvent the Hitler technique (of swallowing countries one by one, while speaking fair to the rest—"my last territorial claim in Europe") and should provide in the aggregate a force that will deter the aggressor or, if aggression should come, ensure eventual victory.

It was against this background that the Chief of the Air Staff, replying at the Royal Academy Banquet on 27th April to the toast of the Armed Forces of the Crown, said: "If all the Atlantic Treaty Powers stand pat on their traditional military sovereignty and try each to build up what are euphemistically called 'balanced forces' of their own—a lot of little national replicas of what should be the over-all military establishments of the Atlantic Treaty—we shall never get anywhere. Only by accepting the principle of integration and making, each of us, the contribution to which we are best suited, can we possibly afford to build up in the service of the Treaty the truly balanced force which, with the backing of atomic air power, as General Bradley said, will not only be an effective deterrent, but can give us security if ever we are attacked."

So we have here quite a new principle in international affairs. Nations are no longer to possess balanced national forces, but are to find national components of a joint defence force. It will be the business of the Military Commission of the Atlantic Treaty Powers to ensure that all these components add up to a sufficient and balanced force.

What, in practice, will this new principle mean to us, in the United Kingdom and the British Commonwealth? The answer to this question cannot be known until the matter has been fully thrashed out, but we can try to make an estimate.

It is very clear that there are today only two navies in the world that count—our own and that of the United States. The Russians may have many sub-

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marines, but they are in no position to exercise command of the seas—they can dispute it only by means of underwater attack. The problem facing the free nations at sea is therefore one of safeguarding our sea communications against submarine attack. Since 1914 we have had nearly ten years' experience of this form of warfare, and we ought by now to know something about it. We know that we require escort carriers, fast escort vessels, specialized submarine chasers, up-to-date radar and last, but by no means least, aircraft. Battleships are not required, and even Fleet carriers are, I think, of secondary importance. No doubt there are enough of the latter already in existence in the United States and British navies.

I suggest that the Atlantic Treaty nations should be urged to build anti-submarine vessels and aircraft. For example, if it is true that the French have recently recommissioned the old battleship *Jean Bart*, they should be tactfully persuaded to replace it carefully on the shelf and concentrate instead on anti-submarine craft.

In the air the problem is less simple. In repelling an invasion of Western Europe the Atlantic Powers will require a properly organized defence, by fighters and A.A. guns, of vital areas; powerful tactical forces to support the Allied armies; and a strategic bomber force capable of crippling the enemy's communications, oil supplies, and war industries, and of destroying his air-fields. I suggest that each country should be responsible for the air defence of its own vital centres, and for providing an adequate tactical force for service with its Army component. In addition, it is clear that the United States will be able to make a great contribution to the strategic bombing force. It has, indeed, been argued that we might well leave this aspect of air power entirely to the Americans, but we must not forget that, in addition to our share of Western defence, we have great responsibilities as the most powerful member of the British Commonwealth. To discharge those responsibilities we require a balanced air force of our own, and this was recognized by the United States when they recently allocated to us a number of American-built long-range heavy bombers.

It seems clear that the remainder of the Atlantic Treaty Powers should be urged to contribute local defence fighters and tactical air forces.

On land, the great bulk of the armies needed to halt an invasion from the East must be provided by the Western European Powers, though there will, no doubt for a long time to come, be in Germany some British and American forces of occupation. The provision of a sufficient force for this purpose is by far the most difficult problem facing those responsible for Western defence. Although it is not necessary, and indeed not possible, to match the Communist hordes tank for tank, or division for division, the disparity in strength, on any method of reckoning, is likely at the outset to be too great for safety. In these circumstances, it is clear that the Western European Powers must make the largest possible contribution in land forces. It may well be that Britain and the United States may have to lighten the burden on these countries by undertaking the provision of larger contingents of naval and air forces. It also brings into the limelight the question of making Western Germany responsible for contributing a share of the force required, and once more raises doubts about the wisdom of our attitude to Spain. These are political questions which can be settled only at the highest level. It is, however, clear that, as far as Germany is concerned, it would be much easier and safer to invite her to provide a national contingent as part of the defence forces of the Atlantic Treaty Powers, than to give her *carte blanche* to rearm herself. It appears to me that a decision on this matter

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cannot now be long delayed without serious prejudice to the security of the free nations.

It is, of course, an indispensable condition of the successful working of this scheme of integrating the national defence forces of the Atlantic Treaty Powers, that these national components should as far as possible use standardized equipment and be trained on common lines. In addition, they must frequently be exercised in co-operation with one another, and a unified command and staff, at least in skeleton form, set up.

All this will require, in some directions, profound changes in the time-honoured notions of national sovereignty and prestige. If it is to succeed, there must be genuine good will, and a readiness to sacrifice national prides and prejudices.

There is good reason to hope that, in face of our common peril, we can rise to the occasion and place the common safety, and the common good, beyond any merely national consideration.

In addition to this powerful moral urge, there is a practical factor which may do much to bring about the desired result. In the present economic plight of this country, and still more of Western Europe, a great part of the money and equipment for the rearmament of the Atlantic Treaty Powers must come from the United States. This will provide an opportunity for moulding national contingents into the desired form, so that they will fit neatly into the pattern. For example, France and Italy, and those countries on which the Treaty Powers will rely for land forces, could be given tanks, guns, anti-tank weapons and aircraft suitable for a tactical role, while this country, as mentioned above, has already received long-range bombers in recognition of its need for a strategic bomber force.

Now it is obvious that this conception of national contingents, fitting into their allotted places in a great Allied Force, must depend on complete confidence and trust in each other among the member nations. Such confidence will no doubt be fostered by the realization that if we don't hang together, we shall all hang separately. But however it comes about, the growth of such confidence and trust between a considerable number of nations, linked together to preserve their freedom in the face of the cruellest and most aggressive tyranny that the world has seen for centuries, must have a profound and lasting influence for good in world affairs. One of the depressing features of history is the almost universal bad faith, suspicion and mistrust of nation for nation, and the consequent insistence on national sovereignty and self-sufficiency. If we can integrate our armed forces in face of a threat to our freedom, can we not go farther and start to integrate our economies in the interests of all? Indeed, the Schuman Plan is a first beginning of such a development, and, although it may have its defects, it is a move in the right direction.

If we can replace fear and mistrust by confidence and goodwill among a large and very important section of the nations of the world, the gain will be incalculable. As yet, it is a plant of tender growth, and all sensible men and women must do everything in their power to nurture it. For it is not too much to say that upon it are centred the hopes of the future of western civilization.

Out of evil, therefore, may come good. Out of the envy, hatred, malice and all uncharitableness that rages behind the Iron Curtain, there may be born in the West the ineffable blessing of international co-operation and trust. Let us hope that it may be so, and that we may live to see, not a third world war in which all that we stand for will be submerged in a welter of horror and destruction beyond imagining, but peace on earth among men of good will.

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Two parachutes with packs attached floating gently down to a small dropping zone in hilly country in the midst of thick jungle on the borders of South Pahang and Negri Sembilan

Clearing prepared by 1st/2nd Gurkhas in the jungle for air supply drop with parapacks. Smoke canister burning during this drop by a Dakota of 48 Squadron

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A SUPPLY DROPPING MISSION IN MALAYA

"Dakota aircraft in the past three weeks have dropped 80,000 lb. of supplies and rations to units operating deep in the jungles of Malaya. Drops have been made over a wide area ranging from Johore in the south to Kedah in the north. The accuracy of dropping in difficult country is best illustrated by the fact that of 223 packs dropped only four containers have failed to be recovered for technical reasons."

—*From the Daily Press*

FOR some time past, in fact ever since the start of the operations against the insurgents in Malaya, we have been reading in the daily papers that the Royal Air Force dropped so many pounds of supplies to Security Forces in advanced areas. These paragraphs have been appearing with such monotonous regularity that people are now inclined to treat them with a certain amount of casualness.

Little do they realize the risks and dangers that the aircrews accept daily to see that the Security Forces are not hampered in their work of chasing the bandits, through lack of essential supplies.

In order to satisfy my own curiosity about what really goes on in the air, I decided to go on one of these supply drops and get some first-hand information. So the other morning, armed with a camera and notebook, I set off for Kuala Lumpur airfield.

On arrival I called in at the Operations Room to see where the supply drops were going to be held that day. Seeing that they appeared to be quite easy I went out to the aircraft feeling that I was going to have a very enjoyable day. On arrival at the Dakota that was doing the drops, I met the C.O. of the Squadron, Squadron Leader Owen Jones, D.F.C., who was the pilot of this aircraft. He introduced me to the navigator, Flight Lieutenant Warren, of Scotland, and his wireless operator.

The rest of the crew consisted of four soldiers of the R.A.S.C., whose job it was to load the aircraft with the required stores, and, when over the dropping zone, to push them out. The aircraft was already loaded when I arrived, the load consisting of 4,500 lb. of various stores urgently required by an advance security patrol, and was packed ready for dropping. Each pack consisted of approximately 300 lb. and had a parachute attached to one end.

We were scheduled to make drops at four different points, so without wasting any time the pilot started up and off we went. We were airborne at twenty minutes to ten, the weather was fairly good and the sky was half covered with light fluffy clouds, or in the words of the navigator 4/8th, strato cumulus.

The first dropping zone was fairly easy to find and was quite a large one, being an emergency strip for the Army observation aircraft. I decided to watch the dropping from the actual scene of the operations, so leaving the comparative quiet of the pilot's cabin I went to the rear of the aircraft.

Here the wind was howling through the open doorway as the doors had been removed before take-off to facilitate the dropping, and although we were quite high, it made me feel dizzy to see the ground rushing past below. However, putting on a good face and gripping the safety straps very tightly, I prepared to watch the proceedings.

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About five minutes before we reached the dropping zone the pilot signalled to the despatchers to prepare the stores for dropping. Each of these men worked with mechanical precision under the direction of their N.C.O., lashings were untied and the stores dragged nearer the hatchway. The N.C.O. also tied a rope from the roof to the floor about 12 inches inside the doorway and to the right: this I found out later was to tie the static lines of the packs to. These static lines were about 20 feet long and automatically pulled out parachutes attached to the packs as they were dropped from the aircraft.

All was now ready for dropping. The wireless operator came down and plugged in a pair of earphones near the doorway; he was then in communication with the pilot and would be in charge of all operations in the rear until all the packs were clear. Under his directions the despatchers stacked three packs in the doorway and the N.C.O. tied the static lines and ensured that the drop would be clear.

By this time we were over the dropping zone and the pilot was circling round for the drop. As we went round we were losing height rapidly. Suddenly three bells sounded. This was the signal to stand by. The despatchers braced themselves against the packs stacked in readiness and the N.C.O. again checked the static lines. Suddenly another bell sounded. This was the signal. With a mighty heave, over went the packs and all that was left was the static lines tied to the anchor rope.

By the time we dropped the packs we were flying at a little under three hundred feet, and, although the area was not hilly we seemed to pass over some of the hills with very little to spare. This procedure was repeated several times until all stores were dropped and, after flying over the dropping zone to ensure that all packs were in the area, we set course for the next dropping.

All the packs had been dropped in the area and, as this sort of dropping depends entirely on the skill of the pilot, it was an extremely good effort. However, the pilot himself was unimpressed, as he said that it was one of the easiest drops he had done. Now that I had seen the actual dropping, I thought that I would remain in the second pilot's seat for the next one and see it from the pilot's point of view. We were now flying over very hilly country with hills of over five thousand feet in height and a jungle that seemed impenetrable.

The thought of having to make a forced landing in this area crossed my mind —not a very pleasant thought either. I could see that a forced landing in this type of country was impossible, and in case of engine trouble a fatal crash would be inevitable.

When I mentioned this to the pilot, he half smiled but agreed that, in case of any trouble, a successful forced landing would be a miracle. Yet, I thought to myself, these aircrew go out every day and never seem to worry. They know the risks they are taking but accept them cheerfully.

We were now approaching the position of the second dropping zone and, looking round, I wondered how the navigator ever found such a small space in such a large area. However, he explained that by flying for a set time from a known pin-point, such as a large hill, he always managed to find the D.Z.

The weather was closing in and, although we lost a lot of height, we could not find a break in the clouds. The whole area where the dropping zone should be was covered by clouds and, as there were large hills in the vicinity, it was not safe to go through these.

We flew round the area for some minutes and after making several attempts to find an opening, eventually broke through. After searching for some time we found the zone, which was a small clearing in the jungle, not more than thirty

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yards long and ten yards wide. From the height we were it looked little more than the size of a dinner plate.

I looked at the hills all around, most of them half covered in clouds, and thought to myself that it would be impossible to drop packs anywhere near the security force. Much to my horror, though, I heard the pilot give the despatchers the signal to prepare for the drop and, circling round, we started descending.

I still shudder when I think of the run-in. We climbed up over one hill, down the valley on the other side, a sharp turn to port, up a bit to get over another hill, and then a very sharp drop to reach the zone. After dropping the load we had to climb very steeply to get away, turning sharply all the time.

I realized now that I was perspiring profusely and could see every leaf on the trees beneath (and above) us. Much to my dismay, we had to make three runs, and each time we came in I started to say my prayers.

However, the pilot remained calm and cool all the time and all he said to me, when we finished was: "Bit tricky that one wasn't it?" Once more all the packs had fallen in the area but, by this time, I was not feeling in the mood to see any more drops. I began to feel sorry that I had ever laughed at anyone being air-sick, and to taste the kipper that I had for breakfast.

The sharp turns at very low level, and the scraping of the wing tips over the tree tops, were having their effect. Wandering miserably down to the rear, I lay down and took very little interest in further proceedings until we landed at Ipoh. Here we loaded up with some more stores; this time it was fresh meat and vegetables for a Gurkha patrol.

I was feeling myself again and, stuck up in the nose of the aircraft with my camera, decided to take some photographs of the countryside. The cloud had thickened considerably since morning, and it seemed as if we were flying over masses of dazzling white cottonwool.

The pilot and navigator did not think that they would be able to find the dropping zone with such masses of cloud, but they were determined to try.

Now the white fluffy clouds were giving way to angry black ones and we kept running into rain. It was getting very bumpy and I thought that I would not be at all sorry when we landed.

Fortunately, when we reached the dropping zone, the clouds thinned out a bit and we were able to drop down, and the Gurkhas had their roast joint for dinner that night.

Course was set for home, and again flying almost continuously through rain clouds, we reached our airfield and landed with a few minutes to spare before dark.

Now my curiosity was satisfied, I knew that the aircrew were not "line shooting" when they casually mentioned the hazards that they meet every day. I knew that the dangers they face are as real as these same men faced during the "Battle of Britain" and the "Battle of Berlin," and, what is more, I also realized they also have the same courage.

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This picture was taken from an escorting aircraft and shows the vast area covered by a convoy of ships

Broadside view of H.M.S. "Triumph," now serving in the Far East in support of the United Nations Forces

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CONTROL OF SEA COMMUNICATIONS: THE ROLE OF AIRCRAFT

By Rear Admiral H. E. Horan, C.B., D.S.C.

In any war the role of the Royal Navy is to control the sea communications of the Empire. Before the advent of aircraft this was done by surface ships, and the principle of destroying anything that threatened our ships on the high seas was the accepted way of ensuring that our ships should "pass freely on their lawful occasions."

The arrival of air power has not in any way altered the task of the naval forces. In some ways it has made the problem more difficult and in others it has made the matter more simple by producing the means of striking at an enemy not only at sea but in his bases.

In history the problem has always been "to locate and report, attack and destroy." That is as true today as ever, and air power has proved in the recent war that it can carry out all these functions in a very efficient way.

It stands to reason that the best way of destroying any menace to our shipping is to do it before the "menace" can get to sea. Countless examples of this can be quoted from history—Drake and his fire ships at Calais, Blake at Vigo, and Nelson at the Nile are examples which spring to the mind at once. On each of these occasions not only did our naval forces stop the enemy forces from interfering with our shipping but denied this facility to those of the enemy.

Next comes the problem of destroying the enemy naval forces at sea. Here again examples from the past are legion. Perhaps the best examples are when Rodney destroyed the French fleet at the Battle of the Saints in the West Indies, and the great victory won over the combined fleets at Trafalgar. On both these occasions the naval forces that were at sea and threatened our sea communications were destroyed and we were free to use the seas as we wished.

In the First World War the chief menace to our free use of the seas was the submarine. By great efforts this was eventually overcome. True, it was a new form of attack, but its object and our counter measures were merely the adaptation of the well-known principles.

The Second World War not only produced a new technique but a new menace. The unrestricted use of aircraft to sink our shipping was added to the same form of warfare used by enemy submarines.

To say we were not ready at first to deal with these two factors is to put the matter very mildly. Quite early in the war the situation of our shipping became precarious, and when the Germans proceeded to drop their magnetic mines by aircraft in our coastal waters their new weapon "gave us furiously to think."

In any future war it is only right to assume that an enemy will not only employ every form of "frightfulness" to stop our even flow of trade but produce new and improved methods of stopping us getting our food and raw materials from overseas. Our enemies know full well that the very life blood of the British Empire depends entirely on our ability to defend our sea communications. Further, the loss of control means that we cannot embark on any overseas offensive operations such as led to the final defeat of Germany in the Second World War.

The question is: "How can we use air power to help us to ensure that we have command of the sea?"

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Air power has given us the following:

(*a*) The ability to strike at an enemy in his bases.

(*b*) The power to "locate and report" any enemy that gets to sea.

(*c*) The means by which our forces can "attack and destroy" an enemy who directly menaces our ships at sea.

For these three functions the specialist use of aircraft and their crews is a natural consequence.

BOMBER COMMAND

First we have Bomber Command, whose role is quite clearly that of destroying the enemy's power of building warships, submarines and aircraft before they ever get "to sea." By their operations not only can they disintegrate production in an enemy's country but they can render it difficult for him to manufacture not only ships of war but also aircraft and thus reduce the menace to our shipping from both these sources.

Even supposing the enemy has been able to complete the ships and aircraft that he requires, then Bomber Command can attack them in their harbours and by sinking or damaging them before ever they get to sea (or take the air) can reduce very considerably the menace to our shipping.

In the Second World War great play was made of the 1,000 bomber raids over Berlin. Looked at in the cold, grey light of early dawn and the after-knowledge of their effects, one wonders if the great gallantry and devotion to duty displayed could have been much more efficiently applied to ultimate victory if the effort had been turned on to obliterating the menaces to our sea communications.

Speaking from the point of view of a naval strategist, would it not have been better to destroy the naval and air forces that threatened our lifeblood, i.e., our shipping?

The next item on the programme is to catch and kill the enemy when he is "out." This job must be divided into two parts:

(*a*) Operations by shore-based aircraft.

(*b*) Operations by ship-borne aircraft.

COASTAL COMMAND

For the first of these, Coastal Command comes into the picture. Working in close co-operation with the various flag officers in charge of the sea areas, aircraft from Coastal Command are always on call for reconnaissance and attack. Constant patrols are maintained in all focal areas, i.e., areas which ships have to pass through when making a "landfall" or moving in coastal waters. By keeping these areas under constant observation, enemy surface ships are debarred from using them and submarines are kept down and if sighted can be attacked by a combination of air and surface craft.

The appearance of hostile aircraft in these areas is, of course, a more difficult matter to deal with. But if sufficient air patrols are present in the vicinity of ships and convoys the task of the hostile aircraft in attacking these is rendered very hazardous. Any attacks on ships to be effective must be pressed home with determination. While doing this the attackers render themselves very vulnerable to the escorting ships and aircraft.

To prove this contention it is only right to point out that in any convoy only 2 per cent. of the area occupied by the convoy in the ocean is occupied by ships. This means that any form of high-level attack is, to say the least of it, a very chancy business and one hardly worth the risk of approaching the target.

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Radar has also played an important part in the defence of shipping. By it, warning of the approach of hostile ships and aircraft is given, and the defending forces can therefore be ready to receive them warmly. Radar in aircraft is thoroughly reliable and adds greatly both to their powers of attack and defence. But above all it gives them a greatly extended range of vision which, after all, is the main thing in the principle of "locate and report, attack and destroy."

NAVAL AVIATION

The question may now be asked: "What is the role of naval aviation in this complicated problem?"

Before starting to answer this it is first necessary to give a short description of the composition of this branch of the Royal Navy.

The personnel is composed of officers and men who have been specially trained in all forms of naval warfare and have made the sea a life study. It is only right to credit them with the "sea sense"—an attribute which only those who have served at sea can ever possess.

To many the possession of this "sea sense" must sound stupid, but who except anyone in possession of it can recognize a ship at sea and be quite sure in his own mind that she is friend or foe? There are many instances of mistaken identity on record which sometimes had unfortunate results. So, when split-second decisions have to be taken, it is imperative that specially trained personnel must be on the spot.

Perhaps the greatest difference in the training of the personnel of the R.A.F. and those employed in naval aviation is that necessary for working the aircraft from carriers. This latter is indeed a very specialized form of both skill and practice. To land on a runway less than 350 feet long when that particular runway is both "pitching" and "rolling," is something that has to be experienced if one wants to get a fair idea of the difficulty.

Again, to find a carrier on a dark night in the open ocean and to land on her when she is "blacked out" is quite a "different kettle of fish" to getting down on an airfield.

In the sea wastes there is nothing with which to fix your position; all the ocean looks alike. In fact, flying over the sea is a very lonely business when you are far away from land or a carrier and homing beacons are absent.

At present the elementary training of all pilots employed in naval aviation is carried out in R.A.F. establishments. It is for consideration whether this should be done in naval air stations where:

(*a*) There is no interruption of the sea training of these young men.

(*b*) In the event of an emergency, pilots could be produced who are specialized in their own particular trade, and thus reduce the time required for making them efficient.

(*c*) Carriers are always at hand for deck-landing training.

These few remarks will show that it is essential for the personnel employed in naval aviation to be a special "tribe" with long experience of the sea and its ways.

AIRCRAFT CARRIERS

Now let us have a look at a carrier. To the old school of naval officers they were a hideous sight and very often dubbed as "expensive ways of making wind." There is, of course, some truth in both these statements, but no matter how hidebound an old salt may be he will admit they are now an essential element in naval warfare. One has only to look at the part aircraft flown from carriers had in the

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sinking of the *Bismarck*, the crippling of the Italian Fleet at Taranto and the victory of Cape Matapan, or the way the Americans used them in the Pacific to be quite convinced that these strange-looking craft have come to stay.

Apart from their role in the control of sea communications the use they were put to in the recent operations in Korea shows their utility and ubiquity.

Put plainly, they can produce at short notice in any part of the world an air-field combined with a refuelling and repair base from which striking forces of aircraft can be operated, and when their task is completed in any particular area they can be moved on to the next at short notice and high speed.

In fact, they can put pressure on an enemy when shore-based aircraft cannot come into action.

CONVOYS

As everyone knows, the present great menace to our sea communications is the submarine. To counter this the convoy system is the best solution. This means that the enemy has to attack at a strong point—a form of warfare abhorrent to any strategist.

Nowadays every convoy will have an escort which has in it the power to deal with any surface ships or submarines that may be encountered. Small surface vessels with special devices for the detection and destruction of submarines are reinforced by aircraft equipped in a like manner. These aircraft must be operated from carriers to get their maximum efficiency. Once a submarine is "sighted" it must be "killed" as soon as possible. Carrier-borne aircraft can produce a striking force *on the spot* at instant notice. This striking force is fully fuelled and equipped, the pilots are fully briefed and so no time is wasted in getting on with the job.

This means that every convoy must have an aircraft carrier as part of the escort. Further, to compete with the weather expected on the high seas, these carriers must be of sufficient size to be able to operate their aircraft no matter what the conditions. Small carriers which do not fulfil these conditions become a liability, not an asset. Hence it would appear that something in the nature of the "light fleet carrier" is what is required.

CONCLUSION

Sufficient has been said to show how every form of aircraft can co-operate in the defence of our sea communications. Each form has its particular role, and the closest co-operation is essential for the maximum efficiency.

Above all, for work in the open oceans the necessity for striking forces ready at instant notice, viz., carrier-borne, is something that goes without question.

The present naval strategical situation may not require the great fleets of Nelson's or Beatty's days, but for the control of sea communications and to ensure that our ships and those of our allies can "pass upon the seas on their lawful occasions," aircraft of both the R.A.F. and naval aviation must in conjunction play a great and almost over-riding role.

[*The views expressed in this article are those of the author and are not to be construed as official opinions.*—EDITOR]

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REARMING THE AIR FORCES

ANY article which contained a comprehensive survey of the progress being made in the rearming of the air forces of the United Nations would indeed be of absorbing interest.

Should anyone be willing to contribute such an article it would be favourably considered for publication in our January number.

While security necessitates the details of the exact performances of new types being disclosed, our censors could hardly object to a review of the progress of the rearming of the nations on general lines, with pictures of the new types in supply, and even possible prototypes for the various branches of the world's air forces. It would possibly be encouraging to know the extent to which obsolescent types had already been replaced by modern aircraft. No such article would be complete without including, for comparison with Western Powers' aircraft, such information as is available concerning Russia's aircraft, types old and new, with a general idea of their performance and armament, etc.

To stimulate interest in this project, we have obtained (through the Society of British Aircraft Constructors and from America) a few pictures of some of the newer types, but unfortunately failed to obtain, in time for this number, the detailed information essential to provide either a useful description of the employment of the aircraft, such details of their performance as has been released by security, or the extent to which they have been supplied to replace older and obsolescent types of the various nations.

From whatever source such an article was obtained, it would be submitted to the censor for security check, but as from time to time so much has been released for publication, we feel sure that the gathering of all of this into one article could hardly fail to obtain a clearance and would be not only interesting but information that the air-minded public should be allowed to know: it might even mollify those taxpayers who are having to pay so heavily for our defence forces.

SOME OF THE NEWER TYPES OF BRITISH AIRCRAFT

The Gloster Meteor IV

A standard fighter of the R.A.F.; has an exceptional rate of climb and manœuvrability. It is also in service with the air forces of the Argentine, Belgium, Denmark, Egypt and Holland. It took a prominent part in the Western Union Defence Exercises.

De Havilland Vampire

The only picture available on going to press was that of the Vampire I. Recently a Vampire V fighter with a de Havilland Goblin 2 jet engine, and having the standard 100-gallon drop tanks, made a fast flight from Lisbon to Hatfield aerodrome. This aircraft covered the 994.75 statute miles (1600.5 km.) from Portella Air Port, Lisbon, in 2 hours 14 minutes, giving a speed of 446.07 m.p.h. (717.73 km./hr.).

The Vampire is the most extensively adopted fighter in the world, having been chosen for the defence of twelve free countries, namely, Great Britain (R.A.F. and Royal Navy), Canada, Australia, South Africa, India, Norway, Sweden, France, Italy, Egypt and Venezuela. It has exceptional versatility, being

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The Gloster Meteor IV

De Havilland Vampire

The Meteor N.F.II Night Fighter

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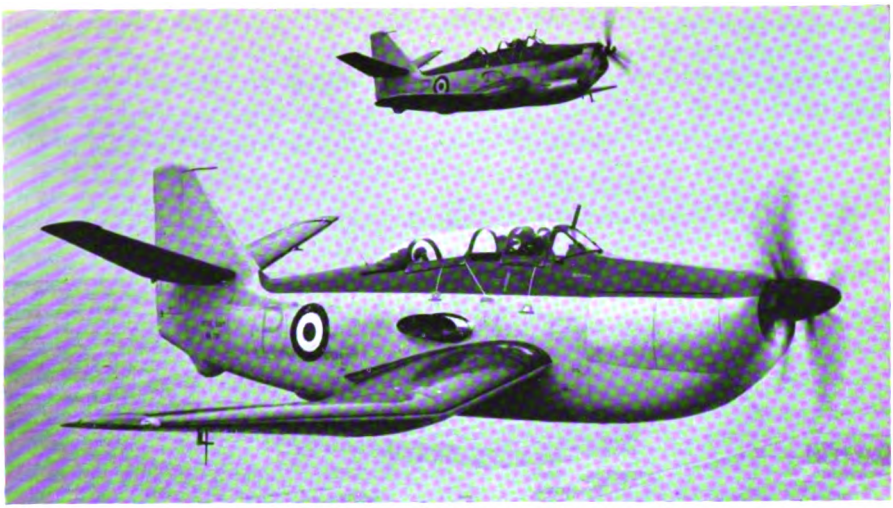
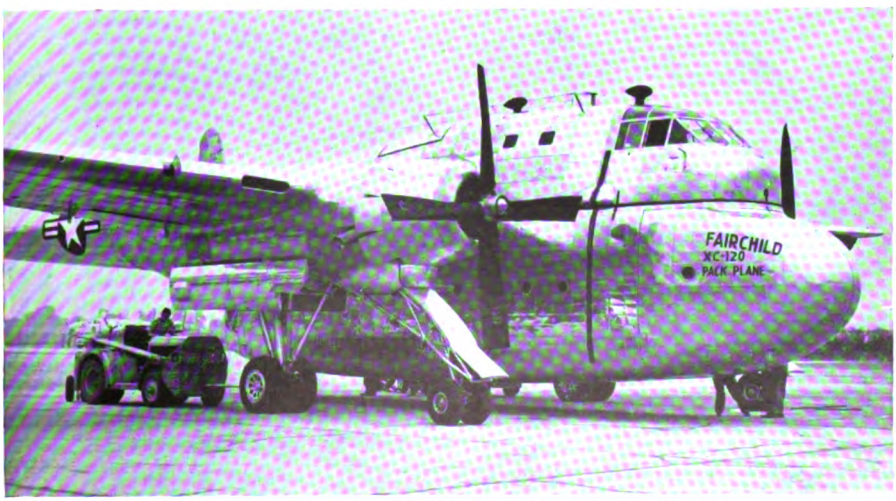


The Y.B.1 and Y.A.5 Anti-Submarine Aircraft

The Canberra Jet Bomber



The Fairchild XC-120 Pack Plane (U.S.A.)

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employed for high-altitude interception, night fighting, and ground attack (with bombs, guns and rockets), and for operation from naval aircraft carriers.

This aircraft is the forerunner of the Venom with de Havilland Ghost turbine, now being built for the R.A.F., and it is a Ghost-engined Vampire that has held the international height record (59,446 ft.—18,119 metres) since March, 1948.

The Meteor N.F.11 Night Fighter

Designed by the Gloster Aircraft Company and Sir W. G. Armstrong Whitworth Aircraft Ltd., it is fitted with two Rolls-Royce Derwent 8 engines. Production for the Royal Air Force is being undertaken by the latter firm of aircraft constructors. Its performance at the Royal Air Force Display at Farnborough this summer before hundreds of thousands of spectators was most impressive.

The Y.B.1 and Y.A.5 Anti-Submarine Aircraft

Our picture shows two of the anti-submarine prototypes built by Blackburn and General Aircraft flying over the East Yorkshire countryside.

These two aircraft have identical fuselages, but the near one, the Y.B.1, is powered by an Armstrong-Siddeley Double Mamba Turbo-Prop unit, whereas the other, the Y.A.5, has a Rolls-Royce Griffon Piston Engine.

This interesting development in parallel provides the unique achievement of the same aircraft being available to the Royal Navy in a single- or twin-engined form.

Despite the somewhat curious lines of this latest anti-submarine prototype of the Navy's, the huge bomb trunk, retractable radome and other military equipment, the aircraft is not bulbous.

The Canberra Jet Bomber

This is Britain's first jet bomber, so anxiously awaited to replace our obsolescent aircraft in Bomber Command. The Canberra's finger-type dive-brakes beneath the wing, are still in the down position as the aircraft levels out after a dive, when showing off its paces to half a million spectators while flying low over the runway at Orly, Paris. It may be remembered that the R.A.F. QUARTERLY managed something in the nature of a press "scoop" by producing the first picture ever published of this aircraft in flight, on the cover of our July, 1949, number (modesty prevents our disclosing how this was accomplished).

It is now in full production for the Royal Air Force, being built by the English Electric Company. Powered by two Rolls-Royce Avons, it has a speed approach-500 m.p.h.

The Fairchield XC-120 Pack Plane. (Experimental prototype for the U.S.A.F.)

This new military cargo aircraft applies the trailer-truck principle to air transportation. Its fuselage (or "pod") can be quickly detached from the aircraft and left on the ground for unloading, while the plane itself flies away for another pre-loaded fuselage.

The XC-120 is expected to supply answers to many of the most difficult problems of military logistics and be a major step forward in making army forces entirely airborne. One of the chief advantages of this new type of aircraft is that it eliminates the long, expensive periods on the ground while cargo is being unloaded, or loaded, as is necessary with present-day transport aircraft. Powered by two 3,250 horse-power Pratt and Whitney engines, the XC-120 has basically the same operating characteristics as the Fairchild C-119. Its detachable cargo compartment has a 2,700 cubit feet capacity and can carry

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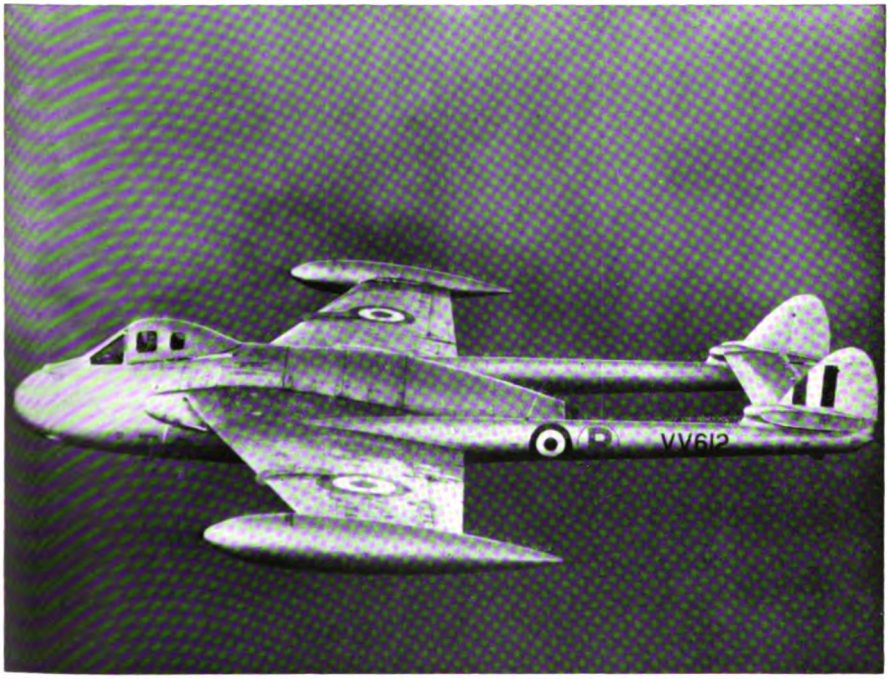
up to 20,000 lb. of cargo. Fully loaded, the entire aircraft weighs about 64,000 lb. and carries a crew of five.

So that the "Pod" can be loaded or rolled away from either end, for the first time in history an aircraft was fitted with quadricycle gears. In addition, the fuselage (or "Pod") has four smaller dual-wheeled undercarriages which, when it is attached to the plane, are removable for stowing in the fuselage.

This aircraft was built simply as a prototype and will be used extensively to test a number of different theories and principles of a detachable fuselage aeroplane.



DE HAVILLAND VENOM Mk.I

A single-seater jet-propelled fighter bomber, fitted with one D.H. Ghost turbo-jet engine of 5,000-lb. static thrust. Maximum speed still secret

THE MOST POWERFUL JET IN THE WORLD

One of the very latest aircraft, the Sapphire Meteor, is claimed to have the most powerful straight jet engine in the world. The Sapphire, built by Armstrong Siddeley, has now been installed in a Gloster Meteor fighter, which is being used as a flying test bed for this engine. Any article on "Rearming the Western Air Forces" could well be divided into what rearming has been accomplished and is in hand and the future advance, based on progress in experimental aircraft by the S.B.A.C.

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Cadets (No. 50 Entry) drawn up in front of the Royal ***Air Force College, Cranwell,*** *prior to an inspection*

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THE ROYAL AIR FORCE COLLEGE, CRANWELL

By Squadron Leader J. F. Powell

ORIGIN AND HISTORY

THE ROYAL AIR FORCE COLLEGE, which recently celebrated its thirtieth birthday, was founded at the instance of Lord Trenchard to train Regular officers for the General Duties Branch of the Royal Air Force. It was to stand in the same relation to the Service as Sandhurst (and in 1920, Woolwich) stood to the Army. The number of officers produced by the College by August, 1939, was only 1,095 but, though the contribution to the Service in numbers was small, the contribution in spirit was great. The College developed in a short time a strong tradition and offered a pleasing contrast of stability to the majority of R.A.F. units with their rather ephemeral lives and their frequent changes of geographic location. The feeling of Cranwell solidarity is well demonstrated by the strong support of the Old Cranwellian Association, which was founded on the original suggestion of the present Commandant, Air Commodore G. R. Beamish, C.B., C.B.E., when he was a pilot officer in 1925.

"The proof of the pudding is in the eating": the proof of the efficacy of a military training establishment comes in war. Cranwell-trained officers, by the time of the post-war reopening of the College, had won nearly 600 decorations, including a Victoria Cross, three George Crosses, seventy-two D.S.Os. and ten Bars, 224 D.F.Cs. and forty-five Bars, sixty-two A.F.Cs. and four Bars. Of the 931 ex-cadets who were on active service at the outbreak of war, 436 were killed in action or on active service. By the end of the war only 438 Cranwell-trained officers were left.

The College reopened on 16th October, 1946, and the regular transfusion of Cranwell blood into the Service began again in April, 1949, when the first full course graduated. A small interim entry, No. 45, composed of cadets from No. 19 F.T.S., who had voluntarily extended their training time to become the Senior Entry for the re-forming College, had passed out in April, 1948. The between-wars Cranwell produced a fine return on investment. Is the post-war College doing so well?

THE POST-WAR COLLEGE

To write on any Service institution in the present flux of aeronautical development is to court the disaster of not being up to date. Though Cranwell has shown more stability than have most units in the past, even its balance is likely to be affected by present trends and the increasing importance of the technical branch and of navigation. But, though size and composition of entries may change in the coming months, it is safe to assume that the Cranwell spirit will remain the same: "plus ça change, plus c'est la même chose."

While the old traditions remain, there are various ways in which the immediate post-war differs from the pre-war training. Some of these changes were purposely selected, others were forced upon the system by altered circumstances, either economic or technical. All of them have had a good effect.

The College, nearly doubled in size, now obtains a wider selection of the

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youth of the country. Fees have been abolished and there are, therefore, no income restrictions. Indeed, the ex-airman cadet is often the plutocrat, for with a trade qualification he is better paid than the direct entrant. As a result, the product of a wider variety of schools mingle in the average entry. Whereas before the war the public schools provided the bulk of the cadets, now a bigger sample from schools of other types is taken. The advantages are that no young man of promise need be kept away, no talent is wasted, and with a wider cross-section of the community the general fund of experience in the College is greater. It is interesting to note in passing that of the first five post-war winners of the Sword of Honour, awarded to the cadet who has exerted the greatest influence on the College, only one has come from a public school.

The course is now longer. It lasts two years and eight months and reflects the increasing complexity of modern aircraft and their ancillary equipment. Before the war, after his two years of training, the young officer was fit to join a squadron. Now, after a longer course, he must face a further period of training at an Advanced Flying School and an Operational Conversion Unit before he can be regarded as a finished product.

The cadet's first six months of training are now spent under airman's conditions, getting a ground-level view of the Royal Air Force. He lives in a barrack block which has to be maintained in a state of scrupulous neatness at all times. Returning from a visit to the coal-face one Thursday in 1947, an officer tritely remarked: "Now for a good hot bath!" This comment was received with even more coolness than is the due of such platitudes, and a cadet replied: "Only a shower for us, sir. We spent three hours polishing the bath enamel and taps last night and must keep them clean for the Commandant's inspection on Saturday." During this period his bearing and drill are brought up to the high standard required before he can participate in the Cadet Wing parades. Turn-out must be impeccable; a briefing flight-cadet corporal once revealingly said: "Remember that tomorrow your turn-out, as usual, must be exceptional." His physique is built up, his self-reliance developed. His academic knowledge is brought up to a common standard of proficiency in both scientific and general studies, however uneven his accomplishment on entry may have been. In the workshops he learns some of the problems of the practical engineer. Above all, he learns by experience to live in a military community. During this period he flies only as a passenger.

A final major change is the formation of an Equipment and Secretarial Wing of the College at Digby, to train Regular officers for these branches side by side—as far as a gap of eight miles allows—with the General Duties officer. The first entry of Equipment and Secretarial Flight Cadets graduated in April of this year. This particular pudding is now being proved.

THE TRAINING AT CRANWELL

Educational theory insists that education must be a mixture of learning and doing, learning the theory and putting it into practice simultaneously. Few institutions can so nearly approach this ideal as Cranwell. The three sides of the cadet's training—flying training, and mind and character development—proceed side by side. They are integrated in producing a complete, balanced individual; and in each aspect theory and the testing of theory by practice go hand in hand.

Flying training must obviously take precedence since the average young man is brought to Cranwell in the first instance by a desire to fly. In his third term, having passed his first examination, the cadet becomes a flight cadet and starts

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upon his career as a pilot and his status as an officer at the same time. The grub from the Junior Flights starts upon the metamorphosis which will end with the award of wings and commissioning. His basic training starts in the Prentice, and after a year he proceeds to applied flying in the Harvard, soon to be replaced by the Balliol. By the time he graduates he has had about 200 hours' day and eighteen hours' night flying. The pass standard is that for the white instrument card rating. Post-war flying training surpasses the pre-war both in the number of hours flown, particularly by night, and in the more testing weather conditions under which it can be carried out. A Meteor 7 has just been established at the College so that the cadet shall have some passenger experience of very high speed flight.

Besides his pilot training the College aim requires that the cadet be trained as a Service navigator. A cadet who, while reaching the required standard in intellect and leadership, fails to make the grade as a pilot, might graduate as a navigator.

At the Equipment and Secretarial Wing the programme hours allotted at Cranwell to flying training are spent on professional studies. The Digby cadet, too, spends more time on the study of a language and economics than does his Cranwell counterpart; he also finds time to acquire the useful arts of driving a car and working a typewriter.

While he is learning to fly, academic education develops the cadet's mental powers. In aeronautical science and engineering subjects he learns how and why his aeroplane flies. The exposition of theory is carefully phased so that he can check the laboratory experiment against his experience in the air, and relate the experience to theory. He studies aerodynamics, engines, electricity, and in the applied flying stage the capabilities and limitations of the weapons and electronic devices which he is learning to use in the air. From the start he is brought into daily contact with the meteorologist; he studies the basic principles of that science and gets into the habit of the continuous observation of the development of the weather.

On the arts side the cadet is helped to express himself accurately, clearly and concisely, both in speech and in writing. He is shown how to set about an intelligent course of reading so that his education can continue in the years when the external stimulus and excellent library facilities of the College are not there to guide him. He is taught the history of war and of the expansion of the British way of life throughout the world, geography and economics, and eventually brings all these subjects together in a study of the defence of the Commonwealth and Empire. In war studies he learns the organization and functions of the three Services and the U.S.A.F., and studies in detail selected campaigns of the Second World War. It is here that the greatest care has been taken to ensure that the cadet develops the forward-looking attitude of mind and that the cynical criticism levelled against the pre-1939 course as "the obsolescent misleading the adolescent" shall no longer apply. He is shown the sort of problems that have arisen in previous war experience and is encouraged to envisage similar problems in the idiom of the future.

During their last year cadets who are not mentally below the average standard specialize on one of the academic sides and produce, under tutorial supervision, a thesis upon some selected subject. By experiment, reading, visits and thought they develop some line of argument and show the results of their research or their mastery of a language. The classic example, of course, of the value of this exercise is that it was in his thesis at the College that Sir Frederick Whittle first developed the idea of the jet engine.

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Many famous airmen send their sons to Cranwell College, where they are taught the great traditions of the Royal Air Force, which their fathers have played a very great part in building up. It must be with a great sense of pride that they "hand over the torch" burning so brightly for their sons to carry on. In the picture above is Air Marshal Sir Hugh S. P. Walmsley, K.C.I.E., C.B., C.B.E., M.C., D.F.C., and his son, Flight Cadet Sergeant I. H. F. Walmsley, who graduated with No. 50 Entry

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Together with his flying training and his mental development goes the cadet's character training, all three main strands being fused together and inseparable throughout his education. Above the technical and mental powers of a senior officer rank his powers as a leader; his staff may tell him the facts or even do his thinking, but he alone can lead. As a people we have always been self-conscious about this quality and have always assumed that people of British stock will produce the necessary leaders at the required time by the light of nature alone. It is only fair to say that this belief has usually been justified and the moment has produced the man. With the crucial importance of the Royal Air Force in national defence, and with the even larger stakes for which we are now playing (not merely national survival but the continued existence of our form of civilization in the world) we can afford to leave nothing to chance. Latent powers of leadership must be consciously developed, especially as an ever large proportion of our officers is coming from families which have not had inbred in them over generations the habit of service and command.

The officer-elect is chosen because in the opinion of those who know him, checked by the most modern methods of personnel selection, he has the qualities necessary to make a leader. These inborn qualities are drawn out by training, and this is the primary task of his Cadet Squadron Commander. The aspirant receives some theoretical instruction in psychology and the art of leadership, and studies the lives of great leaders. He absorbs knowledge of his duties and powers as an officer. He visits units of all three Services and soon detects differences of quality between them; his curiosity is aroused to account for these differences and to find their root causes and so deduce for himself the nucleus of a good unit. Once again theory and practice march together, for on the practical side he lives as a leader. During his senior year more and more responsibility devolves upon him, and in his final term most of the day-to-day administration is in his hands, as is the setting of the tone of the whole College. In games, which he is encouraged to play widely rather than to specialize, this quality is also practised.

The Mess life of the College enables the flight cadets to experience for the first time the traditional dignities and courtesies that go with the status of an officer. The perfection of their drill enables them to feel that acme of team spirit and sensation of communal fulfilment which goes with a "good parade." In the military panoply that centres round the King's Colour they can share that continuity of devotion which has inspired fighting men for 250 years. In the outdoor activities made available to them at a low cost, but one which nevertheless involves some sacrifice if they are to take part in them, in riding—perhaps hunting —shooting or fishing, they get an insight, wherever they were bred, into the English countryside. In the less traditional sport of gliding, too, they achieve a recreational as well as a professional aim.

The various leisure-time activities practise the cadet in the management of others, widen his interests and perception, and quicken his imagination. The numerous societies—musical, dramatic, photographic, engineering, debating and many others—provide him with a recreative outlet and ensure that the old criticism of the narrowness of the military mind are no longer true.

Finally, in organized vacation activities the cadet can practise those sports for which Lincolnshire does not cater, such as mountaineering, sailing, ski-ing and advanced gliding, at a cost just within his pocket. Assisted foreign travel is presumed to broaden the mind and ease language study, it certainly also gives the cadet an added poise. Occasional flying visits to overseas stations kill whole coveys of these birds with one stone.

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IS IT WORTH IT?

A liberal education as wide and deep as this, coupled with flying training, cannot be given without great cost to the country. Frequently in the Service the argument arises that this cost is not justified, that officers less elaborately and expensively trained have done as well as the Cranwell entrants. This, thank goodness, is true and provides a very valuable sense of competition. The Cranwell product knows that he has a tradition to uphold and that he has to justify the national investment which he represents. The other officers, equally, are stimulated to show that without this advantage they can none the less do better by their natural ability and pertinacity. The wider the scope of choice of entrants, the more the routes into the Service, the greater the valuable experience it will absorb.

Another criticism is that within the present stringent limits of Royal Air Force expenditure so lavish an outlay on the production of so small a number of officers is impermissible. The experience of the Trenchard air force has demonstrated that apparent extravagance on training proves to be a wise investment when expansion and the test of war come. In any event, now that the national pocket bears about 90 per cent. of the costs of the undergraduates at our universities, there is no reason why it should not afford this form of further education. Indeed, it would not be unreasonable if Cranwell's share in the national education scheme were recognized, and if parts of its cost were to be defrayed out of the Ministry of Education's grant.

Another criticism which is sometimes levelled against this system is the length of time before the useful product arrives, with the corollary that the maintenance of a high pitch of enthusiasm over so long a period is impossible. There is a degree of truth in this point of view. The Army officer cadet, after a shorter course, can go out into a unit and feel that he is doing something useful while he is still really learning his job. The Naval officer, even in the more technical branches, has a period at sea before the long stretch of his professional courses. The Cranwell cadet, they say, is faced with nearly four years, or if he is an ex-apprentice, with nearly seven years, of training time and apparent stultification before he can regard himself as a productive worker. When compared with the length of training required for the professions of law and medicine this may not seem serious, but the cadet is *ex hypothesi* an active type who is keen to be up and doing. It is hard to see, however, what alteration could be made. Any time spent during the course on doing a semi-skilled productive job would obviously only increase the length of time before the fully skilled officer of most value to the country was ready. The American system of four years at West Point before flying training even started was longer and yet produced good results. The present system rightly gives an advantage to the cadet who is a stayer.

Minor criticisms of the present-day product which are sometimes heard are that it is over self-assured, and that by the time it gets into the Service it is tired by the fullness of the course. A certain amount of bounce in a young man is very natural and such self-assurance, unless based firmly upon solid virtues, will not long survive the rough-and-tumble of Service life. The congestion of the course is a fact which is recognized; the Commandant said at the graduation of No. 47 Entry: "We know that our course of training is intense . . . but . . . it is a challenge which the cadets accept and which the majority successfully overcome.* Similarly, the aftermath of exhaustion is only likely to occur in a few cases.

The Journal of the Royal Air Force College, Vol. XXI, No. 3, page 122.

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To finish an account of life at Cranwell on a note of intensity would be quite false; the Commandant continued his address by saying: "However much we try to grind the cadets down with hard work, they contrive, as I hope and believe they always will, to find the necessary energy to take on something extra." The cadet somehow manages to find time to live a private life and does not live permanently above the snow-line of high ideals. His amusements are much the same as those of his counterpart at the university, though perhaps practised more ardently. He manages to acquire a vehicle of a sort which will remove him from Cranwell's isolation, and drives it as fast as it can be persuaded to go; he delights in moving notices of all sorts from places where they fulfil a useful function to places where they are just ridiculous; he gratifies his atavistic urge to climb high buildings and decorate pinnacles with unsuitable objects; he delights in misleading the law, as in the disgraceful case of some months ago when the tank of a cadet's car was found to contain pink petrol, and much time and trouble were wasted before the analyst's report showed that the colouring agent was red ink.

CONCLUSIONS

Cranwell must be judged in synthesis, which is the whole aim of its training, rather than by analysis. It must be experienced not dissected. As a way of life for a young man it can scarcely be bettered. It provides a full and exacting working day composed of liberal study spiced by competition, of exciting and practical work with the sense of achievement, and of open-air pursuits. It is a life of monastic seclusion tempered by week-ends and leaves, and by the austerity-softening influences of local hospitality. Its spirit is high, not with the uncritical acceptance of a system which has served in the past, but with the mutual confidence between instructors and students that both are giving of their best and working to a common, worthy end.

"Superna petimus" is the College motto. Past generations have scaled the heights; will the present generation make the same ascent? Given the raw material of the right quality in the right quantity Cranwell can give the Service what it wants. This requirement was defined by Lord Tedder in his foreword to the first post-war *Journal of the Royal Air Force College*: "It is to Cranwell that the Service looks for fresh ideas and fresh inspiration, fresh vitality and fresh energy." So high a charge can only be met by a general devotion to duty, and of this His Majesty said at the presentation of the King's Colour: "You are now at the beginning of your careers in the Royal Air Force. Yours is a calling both arduous and daring. It will demand courage, initiative and a readiness to meet danger in a spirit of adventure. It will demand, also, what for many is more difficult to achieve—the zealous and conscientious performance of your daily tasks and duties."

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SOME NOTES ON ANGLO-AMERICAN RELATIONS

By Wing Commander R. F. Pemberton, M.C., T.D.

IT is perhaps natural that relations between the two great English-speaking nations on either side of the Atlantic Ocean should be cordial; but they have not always been so. Owing to a short-sighted colonial policy under George III, combined with ignorance of the situation in North America, we lost the thirteen colonies that might, in more favourable circumstances, have developed into the first self-governing nations of the British Commonwealth, a model for all future Commonwealth countries and an invaluable asset to the British Family of Nations.

How great would have been the benefits to all concerned it is impossible to say; still, it is a reasonable guess that had the United States of America been a member of the British Commonwealth of Nations in 1914 (and in those circumstances the phrase would have come into use a great deal earlier than it did) the First World War would have been won much sooner than it was, the League of Nations would not have become impotent, the Second World War would never have taken place, and the present menace of Communism and Russian imperialism would not be so great. But little advantage is to be gained by contemplating what might have been unless we consider how, taking things as they are at present, we can so act as to bring about the desired situation. The problem, therefore, is: how can Anglo-American relations be brought to a state of cordiality and mutual reliance comparable with the relations that do exist between the United Kingdom and the other Commonwealth countries, so that we may present a united front to all potential aggressors now and in the future?

The need for such a close relationship between Britain and America can hardly be over emphasized. One may say that it is almost a matter of life and death for both parties. If aggressive Communism is a serious danger to America, which lies at least 6,000 miles from Moscow (and it is so regarded in the Western Hemisphere); how much more serious must be the danger to Britain, which lies only 1,500 miles from Moscow and less than 500 miles from the Russian-occupied Eastern Zone of Germany? And if America needs our help (as she admits she does), how much more do we need her help?

But the need for closer relationship with America must not be allowed to obscure the fact that we must also maintain equally close relations with the peoples of Western Europe. The alternatives were clearly stated by Professor Arnold Toynbee in a letter to *The Times* on 26th June, 1950. He wrote: "The actual choice which we now have to make in the United Kingdom is surely one between isolation alike from the overseas western countries and from the continental western countries and closer association with both these groups of countries." We cannot neglect either group, for the interests of both—and of ourselves—are inseparable. In this article, however, we are concerned particularly with our relations with the United States of America, considered as part of the structure of the western community that embraces all the peace-loving and democratic nations on both sides of the Atlantic Ocean.

Our problems, i.e., those of the United Kingdom and the United States of

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America, are interlocked. We both have our strategic problem: to ensure for ourselves protection from the ever-growing menace of Communism. We both have our economic problems; for us, these problems are to close the dollar gap, to find enough money for the maintenance of our armed forces and welfare services, and to become financially sound again by paying for our imports with our exports; and for them, the problem is to sell freely all their surplus products which, at the present time, can be done only by lending their customers some of the money wherewith to pay for them. And there is also the political problem that is common to all the western democracies.

One of the greatest disadvantages under which the western democracies are now suffering is an out-of-date nationalism. Mr. Harry Agar calls it "the Sin of Nationalism." In the eighteenth and nineteenth centuries nationalism was a practicable basis for foreign policy. Distances (or the time taken to cover them) were much greater, frontiers could generally be defended and aeroplanes had scarcely been thought of. Nations could then enjoy much exclusiveness behind their closely guarded frontiers and emerge only to trade, on mutually advantageous terms, with their neighbour nations. But now all that is changed, and most nations are forced, by economic necessity and military danger, to seek the aid of other nations that are stronger economically and militarily, thus becoming largely dependent upon their benefactors or patrons for the means to live and to defend themselves. This is true of the nations of Western Europe, including the United Kingdom, among whom nationalism has become a mill-stone round their necks. Russia, the Communist power and the self-avowed and universally recognized enemy of the capitalist western democracies, with her satellites and cat's-paws, has the enormous advantage of being under unified control; whereas with our separate national governments, we of Western Europe find great difficulty in co-ordinating our plans for defence owing to the number of conflicting national interests involved. And the same is true, though to a smaller extent, as between the United States of America and the United Kingdom.

Now there has been, for a considerable time, a movement for promoting some form of political unity in Western Europe, and the Council of Europe, which meets at Strasbourg, is its present embodiment. The idea of a United States of Europe is a long way from realization—if indeed it ever will be realized, which many doubt. But Western European nations are now realizing the disadvantages of too much national individualism, which is another name for nationalism; and though unwilling at present to sacrifice any of their individual sovereignties, they are seeking for some form of political organization that will give them the economic and strategic benefits of unified policies without, if possible, any serious loss of their independence. That means political unification.

Now if the nation-states of Western Europe, with all their manifest differences, can contemplate such unification and can go so far as to set up a Council of Europe as a first step, surely agreement on these lines between the United States of America and the United Kingdom would be practicable. We speak the same language, we have much the same general outlook on world affairs and we are both capitalist states. It should not, therefore, be very difficult to establish some form of political unification between us, if only in the spheres of economics and defence. It is obvious that neither can do without the other, either economically or strategically. The two nations are now as much bound up together in these respects as are the individual States that form the great American federation.

The time has long since gone by when we could offer to the United States of America "dominion status" within the British Commonwealth, as Mr. Churchill offered it to France in 1940. Neither can we contemplate the United Kingdom's

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becoming the forty-ninth State of the Union. So far we are not prepared to go. We respect, we may even admire, the American way of life; but we consider our British way of life suits us better and should be maintained in these islands on a separate national basis. We also have interests in, and obligations to, the other members of the Commonwealth; and we are an integral part of Western Europe. Even so, but without prejudice to these considerations, some form of political unification between the United States of America and the United Kingdom is desirable in order to simplify the economic situation, to strengthen our joint defence arrangements and to reduce delay in making and implementing strategic decisions. As to the form such political unification might take, I can offer no suggestions. I simply state the problem.

The United States of America, it has been said by an observant British lecturer in America, is now rapidly taking shape as a nation. She has long passed her amorphous and indeterminate stage and is now displaying all the characteristics of an adult nation, though she has but recently come to full stature. She has entered into nationhood at a time when world affairs are particularly complicated, sensitive and explosive; she finds herself forced to occupy the position of a great—possibly the greatest—world power; and she is gallantly shouldering the enormous responsibilities that position entails. We, on the other hand, have had our century or so of world predominance and, through no fault of our own, have been forced to take the second—or possibly third—place; but we can still offer an invaluable contribution to the welfare and peace of the world. With our vast experience of colonial government and of policing all the seas and a quarter of the land surface of the world, we can offer to America the benefit of that experience of which, if she is wise, she will avail herself. And, to do her justice, she is availing herself of it.

The most noticeable factor in America's attitude to world affairs is a great and widespread suspicion (we need not call it fear) of Russia, whom she suspects—and with good cause—of trying to undermine her freedom and prosperity. And America has two outposts, North-West and East, both in the direction of Russia. They are Alaska and Great Britain. Alaska is hers to use as she wishes, but Great Britain is not. Therefore, it would be to America's advantage, as it would be to ours also, if our economic and defence policies could be unified.

Perhaps the American citizen, being comparatively new to the kaleidoscope of international politics, is apt to be too jumpy and to regard as serious crises many international events that more experienced men recognize as merely conventional moves in the game of diplomacy. If so, our longer and wider experience will be valuable as a stabilizing influence in any political union we may enter into with America. But, be that as it may, every circumstance of the international situation in the modern world points to the need for a closer affiliation between the United States of America and the United Kingdom; so that matters in which we are both interested and in which we must work together—and they are many—may be the more effectively handled.

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THE AIR FORCES IN PARLIAMENT

THE STATE OF THE ROYAL AIR FORCE

A RECENT communiqué of the North Atlantic Treaty Council advises national governments to "concentrate on the creation of balanced collective forces," and Lord Swinton very shrewdly took that as his text for a speech and debate in the House of Lords on the subject of the Royal Air Force.

What precisely is meant by "balanced collective forces"? This we have not been told. The defence planners under the North Atlantic Treaty have decided on the composition and size of the forces they will require; but they have not yet allotted to each national government its contribution. Until this is done, we cannot know how it is to affect the Royal Air Force. Will the British contribution to that force be itself a balanced force; or will the Air Forces at the disposal of the Council of the North Atlantic Treaty be balanced as a whole by drawing fighters from some nations, bombers from others, transport aircraft from some and aircraft for operating above the seas from others? We fear that, in the words of Lord Munster, balanced collectives forces may mean unbalanced national forces.

It appears that General Bradley stated before the Foreign Affairs Committee in Congress some time ago that the United States Air Force had been charged with strategic bombing, and that Britain, France and the other countries of Western Union would do almost all the short-range attack and air defence. This would put Western Union at the mercy of Congress, which might at any time withhold the necessary bombers for long-range strategic bombing. And a distinction must be drawn between heavy bombing as a long-term programme for destroying enemy war potential and heavy bombing for the immediate purpose of air defence and counter-attack. The United Kingdom will always need heavy bombers, not only for this latter purpose but also for Imperial security and for the adequate air defence of Western Europe.

This is a matter of vital consequence to this country; for, as Lord Swinton said, unless we give adequate scope to the competing genius of our designers we shall not get the basis upon which to concentrate. Our designers have shown outstanding ability in jet technique, both for fighters and bombers, and their ability should be given the fullest possible scope. Therefore, it is most desirable that our contribution should consist of aircraft of all kinds. The practical and psychological effects of such a policy would also justify it. The United States of America, as well as all other signatories of the North Atlantic Treaty, would benefit by our operating both bombers and fighters, and any tactical air force (which we should certainly have to contribute) would have to include both bombers and fighters. Lord Trenchard gave another reason why we need a balanced national Air Force. "We are," he said, "unpleasantly close to the potential enemy, and we must be ready for instant action in the air, over the sea and over the land."

For these reasons, the following statement by Viscount Alexander of Hillsborough, which he made at the end of the debate, is most welcome. He said: "There is no intention that the Royal Air Force shall concentrate on one particular role, or that the part we play in the defence of Western Europe will be such as to result in any unbalance of the Royal Air Force."

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The United States of America, it has been said by an observant British lecturer in America, is now rapidly taking shape as a nation. She has long passed her amorphous and indeterminate stage and is now displaying all the characteristics of an adult nation, though she has but recently come to full stature. She has entered into nationhood at a time when world affairs are particularly complicated, sensitive and explosive; she finds herself forced to occupy the position of a great—possibly the greatest—world power; and she is gallantly shouldering the enormous responsibilities that position entails. We, on the other hand, have had our century or so of world predominance and, through no fault of our own, have been forced to take the second—or possibly third—place; but we can still offer an invaluable contribution to the welfare and peace of the world. With our vast experience of colonial government and of policing all the seas and a quarter of the land surface of the world, we can offer to America the benefit of that experience of which, if she is wise, she will avail herself. And, to do her justice, she is availing herself of it.

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Then there is the mobility of our air forces—one of their most valuable characteristics. Mobility, the Secretary of State for Air has said, is an essential complement of balance. Mobility depends on widely dispersed and conveniently situated air bases—not simply airfields with landing strips, but properly equipped air bases with large supplies of petrol, ammunition and spare parts, adequate repair shops, radar installations and proper defences against attack by air or by land. Do these, we may ask, exist? And if not, are they planned and in course of construction? For we shall have no time for planning or constructing them when the next world war breaks out. His Majesty's Government can rely on the courage and skill of the Royal Air Force and of the Air Forces of the other Commonwealth countries; but if these are improperly equipped or not provided with the necessary bases from which to operate, they cannot perform their functions, and some of the territories or forces they may be expected to cover will be lost to the enemy. Large aircraft carriers are no substitute for air bases; for they need huge docks to repair them and a host of escort vessels to protect them, and they are, at best, extremely vulnerable and may be sunk in a few minutes as the *Prince of Wales* was sunk by Japanese aircraft in the last war.

Lord Douglas of Kirtleside expressed anxiety as to the size and strength of Coastal Command. Is it adequate for its very important role of protecting, in co-operation with the Royal Navy, shipping convoys as they approach or leave the British Isles? This duty is divided, naturally, into two parts: anti-submarine and anti-shipping patrols. As to the former, it appears that half the enemy submarines destroyed in the last war were bagged by Coastal Command aircraft, which shows the importance of the Command. Since in both wars the country was in danger of starvation (both in food and in raw materials) as a result of the action of enemy submarines, the importance of maintaining an adequate force of shore-based anti-submarine aircraft cannot be over-emphasized; and it may be necessary for Fighter and Bomber Commands to yield a little to Coastal Command, which "has always accepted with good grace the role of Cinderella."

In view of the grave international situation and the possibility—even probability—of a sudden attack on the Western Powers, we require overwhelming strength in the air, and therefore priority in defence expenditure ought now to be given to the air. We are, it seems, short of bombers—and for a good reason. When the international situation was assured—as it was some little time ago—the Air Ministry decided not to re-equip with piston-engined bombers or with turbo-jet bombers, but to wait a little while and so gain the advantage of advanced jet bombers then being rapidly developed. Now we find ourselves in an awkward predicament: short of bombers, unable to obtain even obsolescent ones immediately, and still waiting the first of the new jet bombers to come off the line. But we have the consolation of knowing that the Secretary of State is going to double the jet fighter programme; so, perhaps, if the enemy does not come too soon, we shall win another "Battle of Britain" in the skies above us.

Another important question raised in the debate was that of the need for sudden and rapid transport by air of small formations of the Army—anything from a unit to a brigade or brigade group—so that they may be on the spot when, or preferably before, trouble breaks out in any part of the British Commonweath or Empire, or wherever British interests are recognized. Have we the transport aircraft suitable for this purpose; and are we capable of providing such an air-lift at very short notice, and of maintaining the necessary supply services to the forces so lifted? With the great reduction of Transport Command this would seem unlikely. Yet it is of great—perhaps paramount—importance; as timely action of this sort might well prevent the outbreak of a local war which, in the

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present uncertain state of international affairs, might develop into another major war.

In the course of his reply, Viscount Alexander, on behalf of the Government, gave the following heartening information: (i) Jet night fighters will be in operation next year; and at the end of 1951 the greater part of Fighter Command night fighter force will have them and the night fighter force will be increased. Night fighter squadrons are to be re-equipped progressively with Meteor night fighters, which can also operate by day in weather conditions in which day fighters would be grounded. (ii) The "Canberra" has completed all its trials with great satisfaction to all concerned and it is now on the order line for production. He hoped to see bomber squadrons fully equipped with this machine in operation early in 1951. (iii) Research and development work on the heavy jet bomber is proceeding.

OUR PRESENT DANGERS

In commenting upon the important defence debates which took place in both Houses of Parliament recently, we cannot do better than begin by paying tribute to the gallantry of the American forces in the Far East, using the words of the Lord Chancellor, who said: "In time to come, the United States will look back with pride on the work of her sons in Korea. Hopelessly outnumbered and entirely outgunned, they fought and are still fighting a staunch and effective rear-guard action."

What was the situation that called for a two-day debate in Parliament just before the summer recess? Soon after the General Election of 1945, international relations began to get more and more tense. Starting in China, the danger soon appeared also in Greece, in Turkey, in Persia, in Malaya, in Berlin and last—so far—in Korea. But though the actual fighting is now taking place in Korea, that is not the real danger to us or to the Western Democracies. What has happened in Korea may well happen at other places in the Far East, in the Middle East, and even much nearer home. We have to consider the defences of Western Europe and of our own country. The main danger for the Western Powers is in Europe. Nevertheless, no loyal member of the United Nations could remain neutral in the war in Korea with any semblance of honour. Moreover, whatever may be the danger of standing firm, the danger of abandoning South Korea to her fate would be infinitely greater. For the invasion of South Korea is part of a deliberate and carefully planned campaign engineered by Russia in furtherance of her intention to dominate the world.

It is, of course, impossible to say what were Russia's motives for launching, through the agency of a satellite, the invasion of South Korea. Whether it was intended merely as a feeler, or as one of several planned incidents leading up to a general war, no one outside the Kremlin can know—at present. But there are two conclusions the Russians can draw from the events in Korea; they may conclude that the Americans are weak and the British degenerate, in which case nothing can prevent a third world war; or they may conclude, from our prompt reaction in Korea, that every such aggression would be opposed by increasing force, in which case they may see that it would be good to come to terms with the Western world. Everything, therefore, points to the need for increased preparations and for immediate and powerful opposition to aggression wherever it may occur.

But, indeed, the power of the potential enemy is formidable. Mr. Shinwell gave some figures in the House of Commons on 26th July. Russia's defence expenditure, he said, is no less than 13 per cent. of her national income. She has an active

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army of 175 divisions, of which one-third are mechanized, with about 25,000 tanks; and many of those are ready, in the Soviet Zone of Germany, for immediate use. She has 2,800,000 men under arms and could double that number on mobilization. To back up this force are 19,000 military aircraft (including jet aircraft of the latest design), both bombers and fighters, and considerable naval forces including strong submarine fleets, many of modern design. Mr. Churchill said that a reliable estimate of the present strength of the Russian U-boat fleet was 360 submarines, divided between the Pacific and the West, of which 100-200 were high-speed, ocean-going craft. He added that the Russian U-boat menace to our trans-ocean lifeline and world communications, covering all American reinforcements for Europe, would be far more severe than were the German U-boat attacks in 1939-1940. These figures may not be accurate, but it is unlikely that they exceed the true ones. For instance, Mr. Vincent, Chairman of the Armed Services Committee of the House of Representatives in Washington, quoted the total Russian tank strength at 40,000 or seven times that of the United States of America; and, as Mr. Churchill said: "We have seen, in Korea, how formidable even a few score of tanks can be and how tough the Russian tanks are." Russia can also command the assistance of a powerful Polish army under a Russian Commander-in-Chief, and another, though less trustworthy, army in Czechoslovakia, where also the great Skoda works are steadily pouring out weapons.

In contrast to this, the Minister of Defence, referring to the forces at the disposal of the Western Union, said: "I will not conceal from the House that the forces at present available, or in sight, fall a long way short of requirements, estimated even on the most conservative basis," a statement which he repeated almost word for word on the following day. It appears that Western Union could deploy only twelve divisions against the Soviet's eighty in Europe; and, of these twelve, less than two are armoured while the Russians have twenty-five to thirty armoured divisions. On this basis, Western Union is proportionately far less prepared to defend itself than was South Korea.

In view of the present emergency, our Navy will speed up the modernization of ships and accelerate new construction; while the R.A.F. will speed up the reconstruction of the radar chain, extend and repair certain airfields in the United Kingdom, acquire additional fighter aircraft, overhaul reserves of piston-engined fighters and undertake some stockpiling. All this will cost the extra £100 million promised, of which rather more than half goes to the R.A.F.

The problem of Western Germany, too, is becoming acute. The defence of Western Germany is at present in the hands of the United States, the United Kingdom and France; but there have been suggestions that the Western Germans themselves should take an active part by providing a German contingent in the Western defence forces. That might be a very dangerous policy, and France is uncompromisingly opposed to it. But it is difficult to say how it can increase the existing danger of the Russians overrunning Europe, and it should decrease that danger considerably; for the Western Germans have no sympathy with the Russians or with Communism, and it would be not only fair but also good policy to give them the means to defend themselves. Otherwise we should be making a present of the Western German people to Russia, who already has the Germans of the Soviet Zone under her control. As Mr. Churchill said, at present we have followed the principle that the only Germans who may be rearmed are the Communist Germans in the Eastern Zone, and these have been formed by the Soviets into a highly effective police army of 45,000-50,000 men, or more, with powerful weapons and with considerable off-shoots in the Communist cells and caches of arms known to exist in Western Germany.

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What are now the actual dangers to Western Union and to the British Isles? In relative strength of arms and armoured forces we are probably outnumbered as we have never been before. M. Reynaud has said that the Soviet armies could cross Europe and reach the Atlantic coast before any substantial reinforcements from America could arrive. If that is so, we in Britain, though still protected by the Channel, would be subjected to a bombardment of rocket-propelled and guided missiles incomparably more severe than anything we have hitherto endured. As to the danger of invasion by air, our pilots and machines may still be superior to those of the enemy (though this has yet to be proved), but Russian aircraft, based on airfields in France, could outnumber ours by a far larger number than Hitler's Luftwaffe did.

There is, however, a brighter side. The country's productive capacity, according to Viscount Alexander, is far greater than it was in 1939; and the machinery for planning and controlling the production of war equipment is still in existence and kept ready for instant operation. Furthermore, according to some authorities, if the Russians march across Europe they would not be able to trust the Czechs, Poles and Hungarians whose liberties they have taken away, and these peoples would form powerful resistance movements and carry out guerrilla operations in the rear of the Russian armies, as also would the Western Germans if we gave them arms. And, of course, there is the atom bomb, in which the United States has enormous superiority. The atom bomb in the possession of America is still the main defence of Europe against complete subjugation to Communist tyranny. In view of this deterrent, if it can be maintained, there is some hope that Russia will not embark upon a third world war.

Though we have as many and as great dangers to face in 1950-51 as we had ten years ago, we need not despair. Our industrial capacity and that of the free nations of the world is gigantic. Our scientific and technical ability is unsurpassed. In any trial of strength between Russia and her satellites on the one hand and the forces of the democracies on the other, there can be no doubt which in the end would prevail. If the forces and war potential of the United States, of Britain and of the Commonwealth Countries, together with those of Western Europe, are properly organized, there will be strength enough not only to win a war, but to prevent it. Britain and her allies must clearly, therefore, make ready for war as fast and as efficiently as possible. In the present situation, that is undoubtedly the best way of avoiding war.

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GENERAL SERVICE TRAINING

(DOMESTIC CHORES PHASE)

By Wing Commander H. R. Patterson, O.B.E., M.A.

WHEN Marshall Aid ends in 1952 the emphasis must be more than ever on self-help. Although heads of families are by nature and obligation self-helpers ("Help yourself to cheese, dear, I haven't made a sweet"), it is thought that Service husbands might welcome a few training notes on the subject of domestic duties. Indeed, such is the importance of this matter that in these days of man-power shortage no General Service Training Scheme can be regarded as complete without some mention of it.

It has unfortunately become almost a custom that the pre-breakfast self-help is done by the already overburdened husband. Arising at 0600 hrs. he is awakened by stubbing his toe on the dressing-table. The first combustion chore is to put the kettle on for tea. The principles underlying all subsequent operations are those known as the Conservation of Energy and the Principle of Least Work. Never move from A to B unnecessarily or without a full load for both the out and return journeys. An example on fires and grates will illustrate the point.

The coke furnace is vigorously attacked with a fire-rake. The unconsumed masses of fused slate and iron which predominate must be hand picked. These and the other major content—ash—are removed and taken to the ash-bin: on the return journey bring back cinder pail, hand-brush and shovel, and hod of alleged solid fuel. Pause to light the furnace with the gas poker. (*N.B.*—Gas pokers should not be ignited by means of a cigarette held in the lips.) Do not put on too much fuel to start with because too many stones and slate are apt to stop the draught. Proceed with the cinder pail, hand-brush and shovel to the sitting-room. Insert the cinder pail in the draught of the chimney before filling it with the remains of last night's fire. This will not prevent fine ash settling all over the room, but it shows that you are trying. Return again to the ash-bin, taking coal-dust (addressed to the Coal Board for reblacking), shovel and brush and coal scuttle. Refill coal scuttle with black diamonds, return to sitting-room and lay fire. Collect old newspapers and take them to the kitchen which is now full of steam from the kettle. An ominous smell of rubber indicates that the gas poker is red hot, which is confirmed by a nasty blister on the palm an hour later.

The point I am trying to make is that no move should be made empty-handed.

"Washing-up" chores vary in arrangement and intensity according to the size and philosophy of the family. There is the full-scale operation crewed by the slosher, principal wipe, second wipe, and putter-away (with a sort of M.C.

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hovering in the background) and the small "laugh and throw-away" affair as when sausages are eaten straight from the pan. Recommended equipments are an apron, plate-rack and a chemical invented by the Women's Institute Soapsuds Kommittee. Also a wife who says "That's all for you, dear" when the saucepan stage is reached. The only known method of cleaning a dish in which an over-baked cheese soufflé has settled is to give it to the dog.

Advanced self-help husbands have been known to undertake house-cleaning chores. One never knows when desperate circumstances may drive even Senior W.Os. to such degradation. A few hints are therefore included on this subject, dealing, as an illustration, with the morning inspection and servicing of a room where friends have been received the previous evening.

Draw the blinds and open the windows so that when the smoke has dispersed the contents of the room may be arranged as follows: (*a*) those for sweeping, (*b*) those for dusting, (*c*) those for evacuation, including empty bottles, cigarette cartons and remaining guests (full or empty). Again observing the fundamental principles, whilst collecting items under (*c*) a duster should be activated to deal with operation (*b*). Having deposited rubbish and any casualties arising from the dusting operation in the dustbin the sweeping equipment should be collected on the return journey. Should this take the form of a simple brush and pan, a large bandana handkerchief is also required; it should be arranged to cover the nose and mouth and be tied loosely behind the ears. The mechanical or hand pushed sweeper is a distinct advance on the brush and pan. Besides being more dignified in operation it is more efficient: the revolving brushes raise the dust and a cover causes it to settle on the floor again. Thus the handkerchief is unnecessary and the dust is redistributed more evenly. For ideal Conservation of Energy a vacuum cleaner is recommended. These machines are either out of order or make a highly efficient sort of noise: in either case they provide a good excuse for treading in the cigarette ash and pushing the furniture back into position.

Self-help is, of course, only in its infancy. True, one grows a few vegetables and perhaps keeps a few hens, but in the years to come one can visualize great strides being made in the movement. No. R.A.F. quarter will be complete without its semi-detached goathouse and smallholding. Summer evenings will resound with the noise of flails instead of cricket bats. Many an Air Commodore will have been kneading the dough (not that he doesn't need it now) for the family bread long before starting on his buttons. "Soaking-in" will have a new meaning: those who rolled out the barrel will be rolling out the washing. Those old favourites nettle beer and rhubarb wine will exhilarate many a boisterous party. And in the evenings the happy warrior will spend his time weaving cloth for his uniform, weft and warp, as laid down in A.M.O. . . .

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AIR FORCES FORUM OF DISCUSSION

(Write to the R.A.F. Quarterly about it)

LETTERS TO THE EDITOR

DEAR SIR,

It is a saddening reflection that the British who for 500 hundred years have been number one in the world now have to play second fiddle to America, and are no longer in a position to do anything without American approval and backing.

However, this need not be for ever, if the British peoples and its Government will arouse themselves before it is too late.

Once again, if we will only develop some of the robustness and daring of our ancestors we can become both wealthy and powerful. It seems that Asia is definitely lost to us; and to meet the fight that must eventually come we must develop another continent from which we can face a hostile Eastern Europe and Asia. The continent we must develop is Africa. This large continent is still largely undeveloped; who knows what hidden treasures if yet contains? It may very easily produce all Britain's requirements. To do this, private enterprise must be given every encouragement and protection whilst the country is being developed, but whilst this is taking place one thing is of the greatest importance—every care must be taken of the native populations; they must not be exploited, as if they are, there will be an outcry from the rest of the world, and we shall not be left in peace to develop and become once more powerful and independent.

We must create a vast Air Force and military base in Kenya, and from there build a railway across the Rhodesias and the Kalahari Desert to Walvis Bay, in South-West Africa. Diesel trains could be used upon this line.

Walvis Bay, which can be dredged, could be turned into a first-class port, and we then would have no need to worry about the Mediterranean. The Atlantic would then become an Anglo-American ditch which would-be enemies would enter only at their peril.

Britain, as she developed the Dark Continent, could move portions of her population to these parts, which would enable them to be adequately fed at a lesser cost than bringing all food to Britain. Vital factories could be established right across Africa from west to east, and strategic roads built to reach them. Roads are not so easily wrecked and put out of action as are railways, but a railway would be needed, as I have already said, from Kenya across the Rhodesias and the Kalahari to Walvis Bay.

At present, under air threat with the atom bomb and the hydrogen bomb, all England and her factories could be blotted out in one well-forced-home attack

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from across the Channel; but if we have factories dotted about the African interior with the necessary skilled workers and with a strong air base, we shall yet survive.

This can be done and must be done, but it requires a strong, far-seeing Government at Westminster and a British people fully awakened to future possibilities.

KEITH DE WINTON
(*Late Royal Air Force and A.I.F.*)

31*st July*, 1950.

DEAR SIR,

I write in praise of Wing Commander Combe's article, "Ideological War," in the July number. In my opinion he has done a great service in bringing before us so poignantly and lucidly this neglected topic. In a day of almost permanent crisis, when we are looking to our basic national loyalties, it is a form of treachery to be unaware of, or to refuse to see, the nature and strategy of the ideological war.

Since reading the article mentioned above, I have received a significant statement from the Japanese delegation of seventy-one statesmen, local government representatives and pressmen, part of which I quote:

> "England was the leader of the industrial revolution of the nineteenth century and so we look to her to lead us in the spiritual and ideological revolution of the twentieth century which is necessary if the world is to find lasting peace. . . . Russia has advanced in Asia because the Soviet Government understands the art of ideological war. It fights for the minds of men. We appeal to the government and peoples of the West to do the same—to make themselves expert in the practice and philosophy of moral rearmament, which is the ideology of the future. Then all Asia will listen."

Coming from former enemies, Asiatics and Shintoists, the above is arresting, timely and generally in advance of British thinking.

Part of my work here is to give seventeen lectures weekly to boy entrants and airmen. I am finding that ideological instruction, consistent with the agreed syllabus, produces the answers to incentive, waste and frustration. I find, too, that when I apply in a practical way the moral principles of our democracy by putting people before things, building team work and unity, and fighting against waste by using everything for the right purpose and for the highest ends, that a new incentive and purpose takes hold of life as a chaplain. Moreover, to create such a climate is the best way to defeat the subversive factors in Service life.

Yours truly,
CECIL KING.

DEAR SIR,

Apropos of recruits, both Regular and National Service, is it not remarkable that boys who have attended elementary schools should not be able to spell the word "elementary" correctly; and still more remarkable that those who have attended grammar schools and other secondary schools should not be able to spell the words "grammar" and "secondary" correctly? The usual variants are: "elementry," "grammer" and "secondry."

Or does it matter? As the sailor said: "If 'blox' doesn't spell 'blocks,' what does it spell?"

Yours faithfully,
R. F. PEMBERTON.

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A GREAT INTERNATIONAL AND R.A.F. SPORTSMAN

Group Captain Donald Finlay, D.F.C., A.F.C., in action. Although now 41 he is still one of this country's finest athletes; this summer he proved his complete fitness by hurdling 120 yards in 14.3 seconds. Joining as an Aircraft Apprentice in 1925, that year he won international honours for the long jump, and the R.A.F. Championship long jump on four occasions and the high jump title twice. He was R.A.F. Champion hurdler no fewer than sixteen times. In 1937 he equalled the world record with 14.1 seconds in Sweden. This grand sportsman also played a distinguished part in the Battle of Britain

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SPORT IN THE R.A.F.

By J. Sephton

INTERNATIONAL MILITARY AIR PENTATHLON

Two teams entered by the Royal Air Force Modern Pentathlon Association will represent Great Britain in the International Military Air Pentathlon to be organized by the French Armed Forces at Arcachon this year.

The teams will be captained by Squadron Leader G. A. Podevin, the Command Physical Fitness Officer, Fighter Command, who, with Flight Lieutenant L. S. Lumsdaine, a test pilot at Boscombe Down, will form the "A" team. The "B" team will consist of Squadron Leader W. Allsop, Headquarters, Fighter Command, and Flight Lieutenant E. A. Tippell, of R.A.F. Station, Hawarden.

Belgium, the Netherlands, Switzerland and France are each entering two teams. The Argentine, Egypt, Finland, Greece, Italy, Luxembourg, Norway, Sweden, Turkey and the United States of America have also been invited to enter teams.

The teams must first take part in the Air Rally, which entails flying from Paris to Archachon over a set course with a number of turning points, such as a railway station, a church and a bridge over a river, and arrive at Arcachon at a specified time. The route will be notified to the competitors only one hour before take-off.

Having completed this test, teams will then compete in the competition proper, which includes rapid firing with a pistol; swimming (including a 3-metre dive, picking up objects from the bottom of the bath at distances of 40 metres, 30 metres and 5 metres, and swimming back 50 metres free-style, the whole event being arranged on a time basis); fencing (five hits with the foil); and an escape course. This event is a particularly arduous one, in which competitors wearing 25-lb. packs, will first have to negotiate a difficult course before completing a cross-country run of about 12 kilometres, including a river between 200 and 300 metres wide, across which they will have to swim.

In 1948 the Royal Air Force were second in this competition.

Last year the Royal Air Force team, consisting of Squadron Leader Podevin and Flight Lieutenant Lumsdaine, were the winners; the last-named was also awarded the Individual Championship.

We wish them the best of luck as Britain's representatives this year.

ATHLETICS

The 1950 Royal Air Force Inter-Command and Individual Athletic Championships were held at the R.A.F. Stadium, Uxbridge, on 3rd, 4th and 5th July.

Although only one R.A.F. record was broken, the general standard was in keeping with previous years, and enthusiasm and keenness were at the usual high level. No fewer than five title-holders competed, all of whom again won their respective events.

Squadron Leader Reavell Carter won the Discus with a throw of 136 ft. 4½ in.; Group Captain D. O. Finlay, the 120 Yards Hurdles, in 14.3 sec., which, incidentally, was his sixteenth victory in the R.A.F. Championships over this distance; Flight Lieutenant C. A. Guest, an ex-Cranwell apprentice, won the 880 Yards in 1 min. 56.5 sec.; Corporal J. Wilkinson, the 220 Yards W.R.A.F. event, in 28.2 sec.; and Sergeant D. Cobley broke his 1949 time of 11 min. 1.6 sec. by

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4 sec. for the gruelling Two-mile Steeplechase. Later in the afternoon, Sergeant Cobley finished sixth in the Three-mile Race, and scored a point towards his Command winning the Championship.

The men's 220 Yards and One-mile events were the high-lights of the programme. Sergeant Sexton, of Fighter Command, won the first-named race in 22.8 sec., with not more than three feet separating the first and sixth places. Aircraftman Pirie, the 1949 Three-mile champion and the R.A.F. Cross-country Championship winner, ran a grand race in the One Mile, completing the course in 4 min. 20 sec.

The final placing in the Inter-Command Championship gave the R.A.F. event to Technical Training Command, with 117 points, and the W.R.A.F. event to Flying Training Command, with 43 points.

R.A.F. INTER-COMMAND CHAMPIONSHIP, 1950

Aircraftman Babie, of 50 Group, clearing the bar in the finals of the high jump at the R.A.F. Inter-Command Athletic Championship Meeting at the Stadium, R.A.F., Uxbridge

Inter-Service Athletics

In the Inter-Services Athletics, also held at Uxbridge this year, the Army won the championship with 51½ points, the R.A.F. were second with 47½ points, and the Royal Navy third with 35 points. In the women's event the W.R.A.F., with 61 points, defeated last year's champions, the W.R.A.C., who came second with 54 points, and the W.R.N.S. third with 35 points.

THE ROYAL AIR FORCE EQUITATION ASSOCIATION

IN our October, 1949, issue we mentioned that the Headquarters, Bomber Command, Riding Club, which had been functioning successfully since April, 1948, was being replaced by a broader organization open to all R.A.F., W.R.A.F., Royal Auxiliary Air Force and Royal Air Force Reserve personnel serving in the United Kingdom. This was accomplished on 15th August, 1949,

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The resident instructor points out a few common faults to a class of pupils of the R.A.F. Equitation Association at West Wycombe

when the Royal Air Force Equitation Association was formed, with its own horses, stabling and schooling facilities.

The Association is officially recognized by the Royal Air Force Sports Board, and its formation has been promulgated in the Sports Section of Air Ministry Orders (A.M.O./N.763/1949), where its object, constitution and terms of membership are described in detail.

The stables are situated in a pleasant rural setting near Bomber Command Headquarters in the wooded hills above West Wycombe. This has been found to be a convenient central location, and members from other Commands, in particular, Fighter, Coastal, Flying Training, Reserve, and 90 Group Headquarters, are using the facilities regularly throughout the week on days allotted to suit their convenience.

Ten-day courses have also been started and have been attended by officers, airmen and airwomen on leave from more distant units.

Ten horses are at present in general use, and additional horses privately owned by members are accommodated and schooled. A resident instructor is available for both elementary and advanced instruction.

The jumping course is being enlarged to meet the requirements of the equitation events for the R.A.F. Modern Pentathlon Championships, which are to be held at the Association's Headquarters during September/October.

A valuable affiliation is maintained with the High Wycombe and District Riding and Driving Club, whose occasional cross-country rides, mock hunts and paper-chases afford enjoyable opportunities to obtain experience in cross-country riding a a prelude to hunting proper. Local meets of the Old Berkeley (West) Hunt have also afforded some of the members an opportunity of following hounds in the Chiltern Hill country and in the Aylesbury Vale.

Membership of the Association is steadily increasing, and a great proportion of members have graduated from the elementary to the advanced courses. Some of the latter members are competing this season in local gymkhanas.

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LAWN TENNIS

The R.A.F. Lawn Tennis Championships were again held at the All England Club, Wimbledon, from 24th to 29th July.

All events were well supported, with Aircraftman J. E. Barrett, a young left-handed N.S.A. entrant, winning the Singles by defeating another N.S.A. boy, Aircraftman B. R. Rumball.

In the Doubles Championship, Group Captain B. K. Burnett, a previous Singles champion, partnered by Wing Commander E. Holden, were successful in the final against Group Captain R. H. Young and Aircraftman R. B. Rumball.

Flight Officer J. M. E. Wallace won the W.R.A.F. Singles, defeating the 1949 champion, Wing Officer Arkell in the final.

The Veterans' Doubles Championship was won by Group Captain G. R. A. Muschamp and Air Commodore R. H. Stanbridge.

In the Inter-Services Championships, held on 31st July and 1st August, the Army won the championship by 8 rubbers, against the Royal Navy (6) and the R.A.F. (4).

The Women's Services Championships were again won by the W.R.A.F., with 10 rubbers, against the W.R.A.C. (5) and the W.R.N.S. (3).

A RUGBY XV OF TWENTY YEARS AGO

The picture is of the Henlow Rugby XV, the winners of the R.A.F. Inter-Station Cup in 1930-31. This team consisted of many who today are well-known personalities in the Royal Air Force. Flight Lieutenant Beamish, then Captain of Ireland (now Air Vice-Marshal G. R. Beamish, C.B., C.B.E.), Flight Lieutenant Atkins (one Irish cap), Flight Lieutenant Hodder (the captain), who played for the R.A.F. and Harlequins and was killed in action with Bomber Command, Flying Officer Maclean, who played for the R.A.F. and was our Inter-Services Light Heavy-weight Champion, Flying Officer Snaith (inset), Schneider Trophy pilot (now Group Captain L. S. Snaith, A.F.C.), the Commanding Officer, the late Group Captain A. V. Bettington, C.M.G. ("Zulu"), Flying Officer (now Wing Commander) B. S. Cartmel and Sergeant Brereton (who retired as Wing Commander W. Brereton, M.B.E., A.F.C.). No doubt readers will recognize other members of this rugger XV of 20 years ago

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OUR COMMONWEALTH AIR FORCES

ROYAL CANADIAN AIR FORCE

CURRENT EVENTS IN THE R.C.A.F.

U.N.O. Training

PERSONNEL from the North Atlantic Treaty Organization nations have arrived in Canada and are now undergoing Air Force training. Approximately 250 from six European nations will be under training, and these include both Air Force and Army personnel. About fifty student pilots from France, Belgium, the Netherlands, Norway and Italy are scheduled for training, a similar number of navigators and up to 150 Army trainees. Arrangements are also in hand for Portugal to participate in this training scheme.

This is not only a practical way of aiding in the military training programme of these nations, but it will familiarize their officers with one another and with another part of the North Atlantic area.

The nations sending these trainees will continue to provide pay and allowances, clothing, transportation to and from Canada, and personal expenses. Canada will provide food, accommodation, transportation within Canada, normal hospital and medical services, in addition to all costs of training.

Grizzly Bear Spitfire Squadron Re-forms

The Grizzly Bear Squadron, as 411 was nicknamed during the war, was formed on 16th June, 1941, at Digby, in Lincolnshire, and operated with distinction with Fighter Command and 2nd Tactical Air Force throughout the campaigns in North-West Europe.

Throughout its war-time career, 411 Squadron flew various marks of the Spitfire fighter. After formation at Digby the squadron made its home at various points in Eastern and Southern England, stopped for varying periods at Hornchurch, Southend, Kenley, Redhill, West Malling, Staplehurst, Biggin Hill and Tangmere. On 18th June, 1944, just twelve days after D Day, the Grizzly Bears flew across to Beny-sur-Mer, in Normandy, and followed close behind the Allied armies across France, Belgium, the Netherlands, and into Germany.

The war's end found the squadron at Wunstorf airfield, west of Hanover. From August, 1943, the squadron formed part of 126 (R.C.A.F.) Wing in 83 Group of 2nd Tactical Air Force. It remained with the Wing at Fassberg and Utersen, north-west of Hamburg, until disbanded.

In fighter sweeps over Northern France and Belgium before D Day, and in dog fights over the battle zone from the Normandy beaches to the banks of the Elbe,

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the Grizzly Bears counted almost 100 enemy aircraft destroyed or probably destroyed, and fifty more damaged.

The squadron's badge shows a bear rampant, with the Latin motto being translated as "Hostile to an Enemy."

After the war this squadron remained with the Royal Air Force in Germany until disbanded at Utersen on 21st March, 1946.

It is good news to hear that it is now re-forming at Downsview Airport, with Headquarters at R.C.A.F. Station, Toronto. An adjacent farm by the airport has been purchased to allow an extension of the present runway to 6,000 feet, sufficient length to handle new types of jet fighters.

R.C.A.F. Para-Rescue School

At Henry House Field, near Jasper, Alta, twelve R.C.A.F. men and one Navy Chief Petty Officer recently graduated from the Air Force's Para-Rescue School. Here, in the heart of the Rockies, they completed one of the toughest courses of the armed forces. Qualified as para-rescue jumpers, they will now be stationed at scattered points across Canada, as members of jump rescue teams, whose duty is to parachute into the wilderness to save lives. They are preselected volunteers with previous bush experience, of a general high standard of fitness and mental alertness. They are now ready to cope with situations, which may range from climbing a mountain to aid victims of an aircraft crash to leaping into heavily timbered country to deliver a baby.

Henry House Field is ideally suited for this specialized training. Surrounded by towering mountains, it is country suitable for practice jumping, both in open and timbered country; a place where the techniques of mountaineering, ice-field, canoeing or rafting and general bush work can be taught.

The most spectacular part of the training at the school is the actual jumping. Six are made in open country and four into heavily timbered areas. Trainees present a weird appearance when dressed in full jumping kit, which includes hard helmets, heavy wire-mesh masks, specially designed protective clothing, and two parachutes, one for reserve in case of emergency. Also carried is a walkie-talkie radio, ration kits, ropes, knives and an axe.

An intensive programme of physical fitness is necessary to prepare students for actual jumps, this part of the training taking up 120 hours. Instruction is also given in special techniques used when landing in timbered country, which often results in the jumper dangling fifty feet above the ground, his parachute tangled in the upper part of a tree. To prepare for this he learns how to pull himself up the shroud lines of his 'chute, run his nylon "let-down" rope through a ring of his harness and let himself down to the ground.

Learning controlled jumping forms a vital part of the training. In addition to possible injury to the jumper, missing the target by half a mile might mean a day's search through heavily timbered country to locate the wreckage of an aircraft spotted from the air. Estimating wind drift by means of a small parachute dropped before the jumper leaves the aircraft assists in this, but once in the air the jumper himself must control his jump by spilling air out of his 'chute, sending himself in the required direction. Parachutes provided for the rescue men are fitted with two "Derry slots" which allow the jumper to turn during descent, to ensure a pace-forward landing.

The para-rescue badge is a tiny emblem, worn on the left arm, but it is always won the hard way. It designates its wearer as one of the small band of men who stand ready at instant notice to take to the air and jump into the nightmarish country, in any weather, on an errand of mercy, trained to save life.

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ROYAL NEW ZEALAND AIR FORCE

THE DEVELOPMENT OF AIR DEFENCE POLICY IN NEW ZEALAND 1911-1939

BY SQUADRON LEADER J. M. S. ROSS, R.N.Z.A.F.

THERE is today a highly commendable tendency to look to the future and refuse to fall into the trap of thinking that the shape of things to come will necessarily follow the same pattern as that of the past. We quote, with the wisdom which comes after the event, the victory of the blitzkrieg over the Maginot Line, and promise ourselves that we shall not be caught napping again.

All the same, it is not a bad thing, if we want to understand the present and prepare for the future, to have some idea of the past. We can learn from the mistakes of our predecessors and, what is not so generally admitted, we can occasionally find that they had some good ideas which we should have done well to carry out.

New Zealand's attitude towards military aviation forty years ago was conditioned by three factors; the country's remoteness from the rest of the world; its small size, which militated against the need and possibility of supporting an Air Arm; and a relic of the pioneering spirit, which favoured trying something new.

The General Staff considered a Flying Corps in 1911, and two years later the Officer Commanding, New Zealand Forces, announced that the nucleus of one was to be established. An officer had already been sent to Upavon to learn to fly.

General Sir Ian Hamilton, who visited the country early in 1914 as Inspector-General of Overseas Forces, poured a certain amount of cold water on the idea, suggesting that New Zealand should wait a bit. Aircraft design was improving so rapidly that machines were obsolescent almost as soon as they were built.

Then the war came, and all thought of experimenting with aviation was dropped in favour of training orthodox soldiers. Individuals pressed for the formation of a flying school and subsequently a Flying Corps; but the Government's view was that it could not embark upon anything "not immediately conducive to the winning of the war." Eventually, two private schools were formed, and between them trained over 200 pilots who were commissioned in the R.F.C., R.N.A.S. and R.A.F.

By the end of the war, the aeroplane had proved itself as a weapon, and New Zealand asked the British Government for the loan of an expert to advise on

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aviation policy. In response to the request, the late Colonel A. V. Bettington, D.S.O., R.A.F.,[1] was sent out early in 1919.

In his assessment of New Zealand's defence problems, Colonel Bettington showed himself a realist, and one who could see considerably farther ahead than most people at the time. He discounted the probability that the League of Nations would be able to prevent major wars, and pointed out that Japan had emerged from the recent struggle in a very strong position and was likely to turn its eyes southwards for new territorities. New Zealand was a long way from help, and should be in a position to defend itself until reinforcements could arrive. Bettington's judgment, it should be noted, was not clouded by the existence of a supposedly impregnable bulwark at Singapore.

He recommended that a Regular Air Force should be established to a strength of seventy officers and 299 other ranks within four years. This was to be supplemented by a Territorial Air Force which would number 172 officers and 1,760 men at the end of eight years and have produced by the same time a trained reserve of 174 officers and 1,060 airmen. Operational units were to include a fighter and reconnaissance squadron, a scout fighter squadron, a torpedo squadron and two bomber and two flying-boat squadrons. Initial equipment was to be provided by 100 aircraft which the British Government had offered as a free gift.

It was an ambitious scheme for those days, and the New Zealand Government, with an eye to the taxpayer's pocket, decided after due consideration to have nothing to do with it.

For the next few years little was done towards the formation of an Air Force, although it was generally conceded that military aviation would play an essential part in any defence scheme.

In 1923 the New Zealand Permanent Air Force was established, with a strength of four officers and seven other ranks, and the Canterbury Aviation Company's aerodrome near Christchurch was taken over and became the country's first Air Force station. At the same time the New Zealand Air Force (Territorial) was formed, consisting of ex-R.A.F. pilots, who attended annual refresher courses.

In the next dozen years the Air Force developed slowly. It was administered by the Army, and suffered through lack of support. A succession of General Officers Commanding regarded it as an unwanted child and were reluctant to allot it more than was absolutely necessary of the yearly funds available for military expenditure.

Air Marshal Sir John Salmond[2] visited the country in 1928 to advise on defence policy, and recommended the immediate strengthening of the Permanent Air Force to twenty-six officers and 192 other ranks, to serve as a nucleus which could be immediately expanded in the event of war; and the establishment of an efficient Territorial organization. Ultimately, nine permanent units were to be established, at a capital cost of £1.2 millions, with an annual cost of just under half a million.

The depression of the next few years prevented the adoption of these recommendations. In the years 1929 and 1930, only £56,000 was available for expenditure on both civil and military aviation. In 1931 the amount was cut in half, and the next year it was reduced still further. There was not enough money to maintain the Air Force, small as it was. Any idea of expansion had to wait.

In the middle thirties, with the depression over and the international situation becoming steadily more unsatisfactory, the Government started to take a more realistic view of air defence and embarked on an expansion programme. Once

[1]The late Group Captain A. V. Bettington, C.M.G., D.S.O.

[2]Marshal of the Royal Air Force Sir John M. Salmond, G.C.B., C.M.G., C.V.O., D.S.O.

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again an adviser was asked for from the United Kingdom, and in 1936 Wing Commander The Hon. R. A. Cochrane, A.F.C.,[3] came out.

In his view the defence of New Zealand involved three main factors: local defence, the defence of shipping routes and the security of the United Kingdom; and he suggested that the Royal New Zealand Air Force[4] should be developed so that it could play its part in all three spheres. He considered that while Britain held Singapore, New Zealand was not in any danger of invasion, although it might be attacked by isolated raiders. Air attack against the main cities was a possibility, but there was little point in building up a fighter defence system because the cities were all near the coast and insufficient warning would be received for the fighters to go into action.

He recommended, therefore, that the immediate aim should be the provision of two squadrons of medium bombers, capable of patrolling New Zealand waters and locating and attacking raiding forces; of flying to the South Pacific islands; and, if necessary, of going to Singapore to reinforce the R.A.F. there.

The R.N.Z.A.F. was to be reorganized, and constituted as a separate Service divorced from Army control and administered by a new Department of State, the Air Department.

Wing Commander Cochrane's recommendations were adopted, and he remained in New Zealand as the first Chief of the Air Staff, to see the programme started.

In the next three years, as war approached, the original scheme was several times expanded. A training organization was developed to meet the needs of the R.N.Z.A.F. and to train pilots for short-service commissions with the R.A.F. When completed it was to be capable also of training 1,300 aircrew a year in time of war. The Territorial Air Force was reorganized and equipped, and squadrons began training. And a Civil Reserve of pilots and ground staff was instituted, to be called on when war broke out.

The Pacific Defence Conference, which sat in Wellington in April, 1939, took much the same view of New Zealand's requirements as had Cochrane. It recognized, though, that if British reverses in Europe prevented the Home Fleet from going to Singapore, Japan might conceivably be able to mount a large-scale attack against Australia or New Zealand, and recommended that the Governments concerned should be prepared to meet more than the threat of odd raids. In particular, it pointed out that before invading Australia or New Zealand, Japan would need to secure bases in the South Pacific. New Zealand was therefore recommended to take steps to protect potential bases.

As far as the Air Force was concerned, the Conference recommended that two landing grounds should be built in Fiji and a survey of possible aerodromes made in Tonga, and that a reserve of fuel, bombs and ammunition should be kept in Fiji. In time of war, New Zealand was to undertake responsibility for air reconnaissance on a line New Hebrides—Fiji—Tonga. For this, the Wellington bombers which had been ordered under Cochrane's programme would be eminently suitable.

The Conference's recommendations were adopted, and plans made to carry them out.

When war came, the R.N.Z.A.F.'s preparations were not complete; but at last New Zealand had a positive air policy and was well on the way towards implementing it.

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[3]Air Chief Marshal The Honourable Sir Ralph Cochrane, K.C.B., K.B.E., A.F.C.
[4]The prefix "Royal" was authorized by His Majesty The King in 1934.

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SOUTH AFRICAN AIR FORCE

AN INVITATION

THE South African Air Force is indeed a "silent Service." Not only have we ceased to hear from the Editor of the *South African Journal*, but the South African news bulletins and our cables from Pretoria make little if any reference to what is taking place from day to day in the South African Air Force.

We issue an open invitation to anyone, into whose hands this ROYAL AIR FORCE QUARTERLY comes, to break this silence and write to:

The Editor,
THE ROYAL AIR FORCE QUARTERLY,
c/o Messrs. Gale & Polden Limited,
The Wellington Press,
Aldershot.

The Chiefs of the Air Staffs of the Royal Canadian Air Force, the Royal Australian Air Force, the Royal New Zealand Air Force, and the Director-General of the South African Air Force welcomed the introduction of this special section for "Our Commonwealth Air Forces," and subsequently, considerable use has been made of it by them as a medium for keeping the R.A.F. and other Commonwealth Air Forces up to date with ordinary day-to-day happenings.

The idea has even developed farther, and in the series, "Know Your Ally," which appears from time to time, THE ROYAL AIR FORCE QUARTERLY is being used as a means of increasing the general knowledge of the Western Powers of each other's air forces.

As a senior officer in one of the European Air Forces so aptly described our efforts:

"The idea of devoting a number of pages to information on allied air forces is undoubtedly a very sound and laudable one. Now that we are all 'in the same boat,' the air forces of the smaller countries should be looked upon with real interest and understanding and not only with a kind of amiable curiosity. The more each of us knows about the other's special problems and capabilities, the easier it will be to co-operate, should the necessity arise. . . ."

We would welcome articles, grave or gay, from the South African Air Force.

The R.A.F. from time to time contribute articles on their various branches, with pictures of "What the other fellow is doing." Those already published include "The Education Branch," "The Provost Branch," "The Signals Branch," and "The Flying Control Branch" follows shortly. There have been articles on "Life on a Fighter Station" and "Life on a Bomber Station," and "Life at the R.A.F. College, Cranwell" appears in this number.

Similar articles on the South African Air Force would be read with interest by our readers all over the world.

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SOUTH AFRICA AND COMMUNISM

South Africa has given a lead to other nations in her forthright and practical action by passing the Suppression of Communism Act, making the promotion of Communism a criminal offence punishable by the courts. The Communist Party of South Africa, "including every branch, section or committee thereof, and every local, regional or subsidiary body forming part thereof," is now an illegal organization.

THE INTERNATIONAL SITUATION—KOREA

A request for South African troops to assist the United States forces in Korea was received by the Union Government from Mr. Trygve Lie, Secretary-General of the United Nations.

In a statement issued by the Press, the Government indicated that it was prepared to give sympathetic consideration to any appeal for assistance in dire need which might be received either from the United Nations or from those Western nations which associate themselves with the Security Council's resolution.

In view of requests received, the Government decided that special efforts should be made to render military aid, and this has been followed up by a decision to send a fighter squadron with ground personnel to Korea. The aircrews and ground personnel will be drawn from the South African Permanent Force, as they are liable for service only in South Africa; service in the Far East will be on a voluntary basis. Details for the dispatch of this squadron have been worked out by the Chief of the General Staff, Major-General C. L. du Toit, with the Director-General of the South African Air Force, Brigadier J. T. Durrant.

INCREASE IN SEA, AIR AND LAND FORCES

The Minister of the Interior and Mines, Dr. T. E. Donges, said recently that in Africa, as in Korea, Communism was showing its tactics, namely, internal exploitation and incitement. "The better we are equipped, the longer we will delay the evil day and the stronger our chances of averting danger will be." Dr. Donges added that the strength of South Africa's land, sea and air forces had to be increased. More money would therefore be required for arms and reorganization.

In view of the present conditions of international tension, and the necessity that South Africa should be prepared for any eventuality, the Cabinet is considering a programme of further modernization and expansion of South Africa's armed forces.

The Chief of the General Staff, Major-General C. L. du Toit, summoned the Commanding Officers of the various Commands in the Union and South-West Africa to a conference in Pretoria to discuss details of this programme.

LIEUTENANT-COLONEL TO BE REPLACED BY COMMANDANT

The Department of Defence announced officially on 24th August, 1950, that the rank of Lieutenant-Colonel is to disappear from the Union Defence Forces and to be replaced by the rank of Commandant. The necessary regulations will be published in the Government Gazette shortly, when the decision will come into effect.

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BISLEY, 1950

The Royal Air Force Small Arms Association 24th Annual Championship Meeting at Bisley this year again had the support of a large number of V.I.Ps. In the picture above is Air Chief Marshal Sir Arthur Barratt, K.C.B., C.M.G., M.C. (Retd.), enjoying an after-lunch pipe and in conversation with Major-General Leon Johnson of the U.S.A.A.F., and Air Marshal Sir Basil E. Embry, K.B.E., C.B., D.S.O.

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CURRENT EVENTS

UNITED KINGDOM

Thunderstorm Flying

WHERE possible, flight through thunderstorms is in future to be part of the training of all Royal Air Force pilots. Research by U.S.A.F. and R.A.F. pilots is showing that if correct techniques are used flight through thunderstorms is not hazardous. Although the presence of heavy turbulence, snow and lightning can prove alarming to uninitiated pilots and hail can cause damage, there is no reason today why a military aircraft should not fly through thunderstorms if by not doing so they would prejudice the objective of their mission.

The American flight technique, which was developed during a scientific project involving 1,363 traverses through the most active thunderstorms that could be located by radar during two years of investigation, has been confirmed and officially endorsed by the R.A.F. British pilots belonging to the Royal Aircraft Establishment, Farnborough, the Empire Flying School, the All-Weather Training Flight at Singapore, and some of the operational Commands have now collected considerable experience of flight through thunderstorms in many different parts of the world.

It has been found that, generally speaking, the most severe turbulence occurs in a thunderstorm at altitudes between about 10,000 and 20,000 ft. and that aircraft flying below or above these heights are not likely to encounter gusts which would impose dangerous structural strains on the airframe, providing that the appropriate speed has been maintained. As a thunderstorm is chiefly composed of rising and descending air currents, the main technique of flight in these conditions is to ignore changes in height which may be caused by the vertical air-streams although maintaining a constant level flight attitude.

From an analysis of accidents previously attributed to the violence of turbulence inside thunderstorms, it is now realized that many so-called thunderstorm accidents must have been caused by structural failure which has followed an excessive loading being placed upon an aircraft when recovering from a stall which has itself resulted from flying in the storm at too low an air speed.

Taking into account the velocity of the gusts registered in thunderstorms, together with strength factors of the different aircraft in use in the R.A.F., "best turbulent speeds" have now been calculated by aerodynamicists for pilots to maintain when flying through cumulo-nimbus or thunder cloud. These give the aircraft the greatest possible safety margin from the point at which a stall would occur, and so from the stage where the risk is greatest of structural overloading of the airframe. These speeds are generally higher than those previously considered suitable; in some cases they are in excess of the normal cruising speeds.

Creating an "All-Weather" Air Force

As part of the intention to create an Air Force which can fly in all-weather conditions, the stage has now been reached when all qualified R.A.F. pilots, in addition to their flying badge, must obtain an Instrument Rating showing their current proficiency and past experience in "weather" or Instrument Flight conditions. This stage comes with revised flying requirements appropriate to

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Cool and confident in control, the radar operator (Aircraftwoman Hammond) and plotter (Aircraftwoman Joan Stokes) are but two of the small detachment of W.R.A.F. personnel at the London Airport (Heathrow) whose task is to exercise surveillance over the fighter aircraft in bad weather conditions. Pilots can have complete confidence that they will be guided safely through the busy new civil air corridors. This is but one role of the W.R.A.F. that demands considerable technical skill and knowledge

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the piloting of jet aircraft and is marked by the addition of a new top-level instrument rating card—the "master green," denoting the all-weather pilot—to the white and green instrument rating cards already in use.

Before they can obtain their "wings," all student R.A.F. pilots now have to obtain a white instrument rating card as part of their course when taking their ground examinations and flight tests at a Flying Training School.

For a green card it is necessary for pilots to show a record of at least 500 flying hours, and 2,000 flying hours are required for a master green card. Of these totals, at least 10 per cent. must have been as first pilot while handling the controls under actual instrument flight conditions. From now on, too, it will also be possible to earn a master green card by having held a green rating for five consecutive years—a measure designed to assist fighter pilots who normally do not accumulate such large totals of flying as pilots of larger aircraft.

The main object of the Instrument Rating Scheme is to provide a standard indication of the type of weather in which it is normally advisable to permit a pilot to fly. For example, unrated pilots may fly only in visual flight conditions and white card holders only when the cloud base is not less than 500 ft. from the ground and horizontal visibility is not less than one mile. Green card holders are not limited by any weather conditions, providing that they can nominate an alternative destination where suitable radio aids are available and where the weather is forecast to be not less than a 300 ft. cloud ceiling and 1,000 yards' visibility. No weather limitations apply to master green rating pilots and all flights may be made at their discretion.

In the near future the possession of a valid instrument rating card will be a requirement for all flying posts of responsibility in the Royal Air Force.

Badges for Royal Air Force Units

Among a number of Royal Air Force Unit Badges recently approved by the King are the following:

The badge for H.Q., No. 90 Group, depicts a stag at gaze, its neck encircled with an astral crown. Beneath the badge is the motto "Aetherem Vincere," which may be translated "To conquer the upper air." The stag is indicative of the functions of the Group in acting as a sentinel for the R.A.F., the stag being quick to sense, as is radar, the approach of an enemy and to communicate the danger signal to the herd.

A sporran, indicative of the unit's Scottish location, is the device chosen for No. 45 Maintenance Unit, which was formed at Kinloss in 1940. The sporran, an ancient Scottish purse, also suggests the unit's function, which is to preserve —in this case,—the equipment essential to the R.A.F. Beneath the badge is the Gaelic motto, "Deas daonnan deas" (Ready, always ready).

For the No. 3617 (County of Hampshire) F.C.U. badge the device is a goose, behind which is an ogress (a black roundel). The goose, well known for its quickness to sense an intruder, is indicative of one of the functions of the unit, which is the detection and location of enemy aircraft, and the ogress is introduced to denote the unit's ability to operate at night. "Praemonemus" (We forewarn) is the unit motto.

An eagle, holding in its right claw a sword erect, is depicted in the badge for No. 3502 (Ulster) F.C.U., the motto for which is "The wise are awake." The owl indicates the units ability to operate at night and the sword symbolizes the control exercised by the unit over fighter aircraft.

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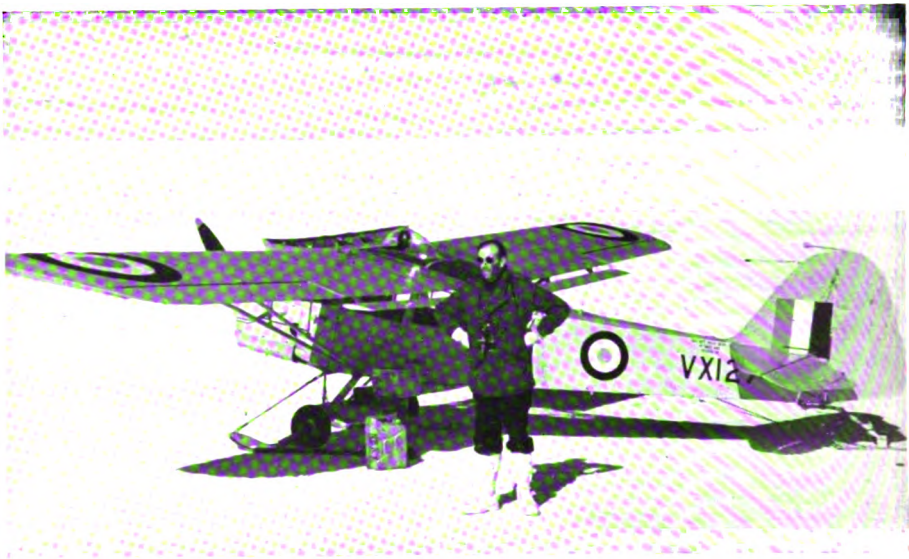

The R.A.F. Commander, Squadron Leader G. B. Walford, with his Auster VI aircraft, fitted with skis, at the Antarctic airfield

The Norwegian sealer "Norsel" in pack-ice in the Antarctic. In the foreground is Flight Lieutenant H. M. H. Tudor, D.F.C., one of the R.A.F. pilots, about to set off on a seal hunt

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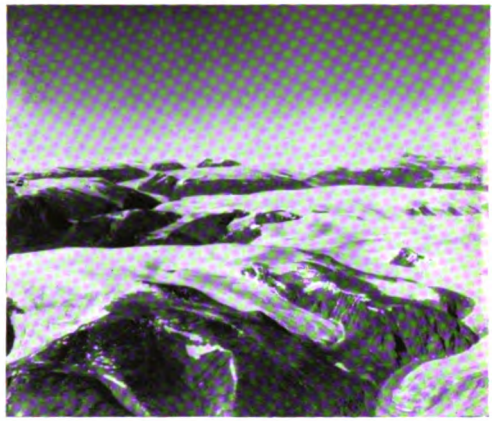
The R.A.F. Covers the World: From North to South Poles

(i) *The Antarctic*

We have obtained some interesting pictures of a recent successful expedition to the Antarctic in which the R.A.F. took an important part, that of providing air reconnaissance in a search for a passage through the pack-ice for advanced bases on the Antarctic mainland and a landing place on the ice-shelf.

Hitherto, no ship built for navigation in ice had attempted to penetrate the pack-ice off Queen Maud Land, and the pack-ice was the major factor in defeating Shackleton's attempt in 1914.



In case you should be passing this way, and to help you to recognize it, here is an actual picture of the North Pole

The R.A.F. participation enabled them to have a unique opportunity to enlarge their knowledge of Polar flying, especially in relation to the effects of climate and magnetism, and to try out many items of Service equipment, including clothing, radio, tools, etc.

The Commander of the small R.A.F. detachment was Squadron Leader G. B. Walford. Others included Flight Lieutenant H. M. H. Tudor, D.F.C., Sergeant P. D. Weston, B.E.M., and Corporal W. B. Gilbey.

(ii) *The North Pole*

A special system of grid navigation for Arctic flying developed by the R.A.F. has been proved satisfactory by the flight of the Lincoln aircraft R.E.367 over the North Pole.

This was reported by Wing Commander E. Russell-Bell (R.A.A.F.), the senior instructor of the R.A.F. Flying College, Manby, Lincs, from which the flight took place. The possibilities of direct air routes over the Arctic makes this confirmation significant. The 3,100-mile round trip to the North Pole was flown at 10,000 feet in 17 hours 40 minutes. At the North Pole there was not so much ice as is commonly supposed; there were plenty of gaps in it, as the picture shows.

A 17-year-old A.T.C. cadet (Flight Cadet Sergeant D. Cox) had the good fortune to be taken as a passenger on this unusual trip.

FRANCE

The French Air Force have now issued the details of a "Five-Year Programme" of rearmament. During the period 1950-55 it is proposed to spend £82,250,000 for the purchase of 1,047 fighter planes, 160 medium transport aircraft, 295 light two-engined aircraft, 200 trainer aircraft and 112 artillery-spotter aircraft.

In addition, £31,102,000 will be used by the Navy for the purchase of 150 fighter planes, 25 heavy amphibious anti-submarine aircraft, 15 long-range anti-submarine bombers, 40 medium transports, 20 two-engined light aircraft and 65 trainer aircraft.

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NORWAY

It is with pardonable pride that we publish a picture which gives proof, if that were necessary, of the great spirit of comradeship that was born of the last war and still thrives between two great maritime nations.

We hope that Major O. T. Mehn-Andersen, D.F.C., of the Royal Norwegian Air Force, from whom the picture was received, will not mind if we quote from a personal letter which accompanied it. Such expressions of opinions cannot but help to strengthen the bonds of friendship between allies of the past and future.

". . . For your own benefit I have enclosed a photo taken just after the unveiling of a memorial in memory of two R.A.F. officers, Squadron Leader A. Reid and Flying Officer A. D. Turner, who lost their lives in this locality during an anti-shipping attack by the Banff Strike Wing (Group Captain the Hon. Max Aitken) on 23rd March, 1945. The unveiling took place at Steinsvik, a tiny and remote village on the west coast of Norway, about two days' travelling by car and boat from Oslo, and Squadron Leader Reid's father was present at the ceremony. It was quite an impressive event attended by nearly 800 people who came by boat from far and wide, and very gratifying to me in particular, because I had had the privilege of personally knowing both these gallant officers. Officiating at the ceremony are (right to left) Wing Commander Crawford-Compton, D.S.O., D.F.C., British Air Attaché to Norway, Colonel Navelsaker, senior Army officer of the district, and myself. The fact that the villagers who took the initiative of erecting the memorial, and bore all the expenses, only number about thirty families, is a good illustration of the esteem the R.A.F. enjoys even amongst the most humble inhabitants of this country. . . ."

A NORWEGIAN TRIBUTE TO TWO R.A.F. OFFICERS

The unveiling of a memorial, erected by the villagers of Steinsvik, Norway, to Squadron Leader A. Reid and Flying Officer A. D. Turner, who lost their lives in that locality on 23rd March, 1945

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Group Captain P. W. Bale is seen accepting a magnificent Somali dagger from a delegation of tribal chiefs, during a tribal gathering at Afgoi, Italian Somaliland

SOMALIA

An Unusual Experience in Somalia

An unusual experience befell the Royal Air Force officers and aircrew stationed at Mogadishu during the recent handing back of Italian Somaliland to Italy after ten years' military and civil administration by Britain under U.N.O. trusteeship.

They were invited to a great tribal gathering—the first held for twelve years—at Afgoi, some fifty miles inland, where they spent a night watching a spectacle consisting almost entirely of primitive native dancing, which went on hour after hour to the ceaseless accompaniment of drums hidden some distance from the scene, rhythmic handclapping, and singing.

The gathering was held under an enormous Baobab tree, the branches of which were hung with hurricane lamps, and around the tree was a ring of bonfires. Beneath the tree were hundreds of black-skinned men, women and children, and seated at tables bedecked with flowers, on a raised platform, were the guests and the principal chiefs. Guest of honour was Group Captain P. W. Bale, Command Navigation Officer at Headquarters, M.E.A.F., who, owing to the illness of Air Commodore E. D. Davis, A.O.C. East African Air Force, had been sent to Mogadishu to be Group Commander during a large part of Operation "Cæsar," the code name under which the handing back to Italy of its pre-war colony was carried out.

After Group Captain Bale had been introduced to the chiefs by Mr. Bruno Martin, who was then District Commissioner, the dancing began and went on until some time after midnight, when, at a given signal, it ceased and a profound silence fell upon the throng. During this interval the principal chief made a

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speech of welcome, which was interpreted by the District Commissioner's interpreter, a coast Arab, who was extremely fluent in Somali and English, and after the speech Group Captain Bale was presented by the chief with a Somali dagger, the hilt of which was of silver and ivory and the blade of fine steel, encased in a scabbard of beautifully worked leather.

In his reply, Group Captain Bale, who had been briefed by the District Commissioner, wished all the tribes plenty of male children, good crops, healthy cattle, and, above all, good rains.

After the presentation, an R.A.F. photographer, to the delight of the chiefs, took flashlight photographs of them posing with the District Commissioner, the Group Captain and the other R.A.F. and British Army personnel present at the ceremony.

Dancing was then resumed, while the visitors went with the District Commissioner to his residence for refreshments.

Next morning a flight of R.A.F. Brigands, on a reconnaissance mission, dipped low over Afgoi and received a tremendous ovation from the large concourse of Somalis still gathered there.

MALAYA

Air Ambulances for Wounded.

Members of the Security Forces wounded in anti-bandit operations in Malaya are now being evacuated from forward areas by an R.A.F. Dakota ambulance Service.

Sitting and stretcher cases are cleared each week from hospitals at Kuala Lumpur, Ipoh and Taiping by Singapore-based Dakotas, with a small staff of Royal Army Medical Corps orderlies on board. A substantial speed-up in the process of casualty evacuation—previously carried out by rail—has resulted.

CYPRUS

New Bombing Range

Royal Air Force bomber and fighter-bomber squadrons in the Middle East have been provided with new practice facilities in Cyprus, with the recent opening of an inland bombing range at Dhenia, near Nicosia.

Situated on a plain between the two mountain ranges of Cyprus, the new range is operated by the R.A.F. Armament Practice Camp at Nicosia, a unit to which squadrons throughout the Middle East go periodically for weapons training.

SINGAPORE

F.E.A.F. Golf Club at Seletar

On the grassy slopes of the Command's Maintenance Base at Seletar, on Singapore Island, the Far East Air Force now possesses another golf course, which was inaugurated recently when the Commander-in-Chief, Air Marshal F. J. Fogarty, drove off from the first tee, and played the first round with the Seletar Base Commander, Air Commodore H. Proud.

HONG KONG

R.A.F. and R.A.A.F. Exchange Leave

An opportunity for R.A.F. personnel based on Hong Kong to spend leave in the cooler temperatures of Southern Japan is offered by a new exchange leave scheme with the Royal Australian Air Force stationed at Iwakuni, 100 miles from the pre-war Japanese naval base of Kure.

Each month a Sunderland flying-boat from Hong Kong, engaged on a navigational training flight, takes fifteen officers and men across the China Sea to

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Iwakuni. They can elect either to remain at the R.A.A.F. base or be quartered at rest camps in the area, from which the Isle of Miya Jima, a famous beauty spot, and other places of interest are easily accessible by road or rail.

On its return flight to Hong Kong, the Sunderland carries R.A.A.F. leave personnel, who are housed in quarters vacated by the R.A.F. contingent visiting Japan. A week later the flying-boat takes the Australian party back to Japan and on the return trip flies the R.A.F. officers and men back to Hong Kong.

Exchange Between R.A.F. and R.N.Z.A.F. in Pacific

Two Sunderland flying boats from No. 88 Squadron, R.A.F., Hong Kong (an aircraft from which went to the relief of the *Amethyst* in the Yangtse last year) have completed a three-month detachment to the Fiji Islands in the Pacific, where they served with a Royal New Zealand Air Force squadron. During the same period, two Catalina flying-boats from the R.N.Z.A.F. squadron took part in the day-to-day activities of No. 88 Squadron in Hong Kong.

In addition to taking part in the normal training programme of the R.N.Z.A.F. squadron, the Sunderlands undertook a number of special missions. On one occasion, at the request of the Fiji Government, one Sunderland flew the High Commissioner of the Western Pacific and a number of officials on a ten-day annual inspection of the New Hebrides Condominium and the British Solomon Islands Protectorate. Later, the same Sunderland flew to the Gilbert and Ellice Islands in the Western Pacific with six officials of the Western Pacific High Commission on board.

Air-sea rescue operations were a normal feature of the Sunderland's routine duties while at Fiji. Air searches for small sea-going craft swept off-course by hurricanes in the area were undertaken, and on each occasion proved successful.

EGYPT

Desert Rescue Exercise

The largest land rescue exercise held in Egypt since the war was recently carried out in the Eastern Desert, some miles inland from the Gulf of Suez, where a land rescue team composed of detachments from Army and Royal Air Force units co-operated with R.A.F. aircraft in searching for a "crashed aircraft," the location of which was indicated by a weighted coloured bag.

The exercise, which was organized by No. 205 Group, Middle East Air Force, was designed to test the combined Land/Sea/Air Rescue forces, and to afford an opportunity for Army and Air Force co-operation in the field.

The exercise began at midday, when a wireless message was received at No. 205 Group Headquarters that an aircraft was about to "crash land" sixty miles south-west of Suez.

Aircraft from R.A.F. Station, Kabrit, set out and searched the area until nightfall, and in the afternoon the land rescue party left Fayid, proceeding south of Suez along the coast road until they reached Bir Odieb late in the evening. A night halt was made there and the party awaited further instructions.

At dawn the "crash position" was communicated to the rescue party, which then proceeded to Bir Quena, thirty miles westwards, where a rendezvous with the searching aircraft was arranged.

En route to Bir Quena a lorry broke down and was left guarded while the rest of the party pressed on towards the scene of the "crash," then ten miles distant. Meanwhile, aircraft arrived overhead and, after making contact with the land rescue party, dropped food and water by parachute on the scene. Leaving the main party behind, three jeeps, guided by aircraft, proceeded to the crash position over very difficult ground.

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After reaching the crash position, the jeeps returned to the main party late in the afternoon and set course for the stranded lorry. In the difficult terrain the vehicles became separated after dark, but contact was re-established by wireless and signal cartridges, the latter making extremely easy the task of the aircraft which were carrying out a night search for the ground party.

Eventually the lorry was located and a night halt made. On the following morning the twenty miles to Bir Odieb, on the shores of the Gulf of Suez, were covered, and after two days in the desert with limited water, the party, ignoring the menace of sharks, plunged into the waters of the Gulf and enjoyed a swim.

Later a Royal Air Force high-speed rescue launch arrived from R.A.F. Station, Fanara, on the shores of the Great Bitter Lake, and took aboard "casualties" from the "crash," this role being enacted by members of the ground party. Mosquitos from Fayid were in close attendance during this phase of the exercise.

* * * *

NEW AIR FORCE JOURNALS

"The Hawk": Journal of the R.A.F. Staff College

The Hawk, the Journal of the R.A.F. Staff College, has been revived by the present course, and the first post-war issue will be ready in December, 1950.

The Journal will follow the lines of the pre-war magazine, and will, it is hoped, provide a much-needed link between past directing staff and graduates and present staff and students.

The Hawk Committee has made every effort to get into touch with graduates of the College. Some 2,000 personal letters have been sent out inviting old subscribers to renew their subscriptions, and others to become subscribers. Response to this appeal has been most encouraging, but many replies have not yet been received. We are publishing this information about *The Hawk* so that as many Service, ex-Service and other interested officers as possible can be told of the revival of the Journal. Full particulars about it can be obtained from the Hon. Secretary, *The Hawk* Managerial Committee, R.A.F. Staff College, Bracknell, Berks.

On present showing it seems that the reissued Journal at five shillings a copy will be fully up to the standard of the pre-war *Hawk*.

A New Monthly Air Force Journal

In November, 1950, the Royal Norwegian Air Force are publishing the first number of a new air force journal ("The Norwegian Air Force Journal").

Its Editor intends to keep all readers informed on news pertaining to the R.A.F., and hopes to secure contributions to its pages from members of the Royal Air Force and Commonwealth Air Forces.

In the July number of the R.A.F. QUARTERLY the Editor of the new Norwegian journal (Major O. T. Mehn-Andersen, D.F.C.) contributed a most interesting article on the Royal Norwegian Air Force, in our series "Know your Ally." We hope that R.A.F. officers will reciprocate by offering him articles concerning our own Service of interest to officers of the R.N.A.F.

The first issue of "The Norwegian Air Force Journal" will contain an article by Air Marshal Sir Hugh P. Lloyd, K.B.E., C.B., M.C., D.F.C.

Regular contributors to the QUARTERLY please note that communications should be addressed to:

THE EDITOR,
"NORSK LUFTMILITÆRT TIDSSKRIFT,"
MYNTGT 2, OSLO, NORWAY

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BOOK REVIEWS

Keep the Memory Green—The Story of Dunkirk. By Lieutenant-Colonel Ewan Butler and Major J. Selby Bradford, M.B.E., M.C. 180 pp. Illustrated. (Hutchinson & Co. Ltd.; 12s. 6d.)

Ten years have passed since the tragedy and triumph of Dunkirk—sufficient time for historians to look back dispassionately on the events of May and June, 1940, weighing their importance and influence on the battles and victories which followed.

At the time, a great surging of relief at so great a deliverance gave to Dunkirk almost the attributes of a victory. Later, there was a tendency to dismiss it as a gallant rearguard action fought in the face of overwhelming odds, which enabled Britain to fight on from her own shores but which was, nevertheless, a withdrawal, a defeat.

Now, in retrospect, we can sort out the truth, and the whole operation assumes a new character. With the aid of German documents we can prove that the B.E.F. never stood the slightest chance of success; we can also gauge the true measure of its achievement.

The authors of *Keep the Memory Green* do not claim to have produced a military assessment of the Battle of France and the withdrawal through Dunkirk. They were members of the B.E.F., and, in their own words, have written the book "for men like ourselves of all ranks of the B.E.F., their families and friends, in the hope that it may recall a little the comradeship of ten years ago, and remind those who did not serve with us of that small British Force which first faced the full might of Nazi Germany." They achieve their object and, in doing so, give to the average reader a far clearer, more readable commentary on the events leading up to the evacuation than could any official history.

Both of the authors were soldiers, but there is no inter-Service rivalry in this book. They explain, but do not excuse their colleagues' fierce resentment of the R.A.F. at that time, when the Air Force seemed to share none of their privations and appeared to be discreetly absent while they were being attacked unmercifully by the *Luftwaffe*, so that "to have any connection with the R.A.F. was, in the unseeing eyes and uninformed brains of a quarter of a million soldiers, almost as bad as being a 'flaming Jerry.' "

Actually, Colonel Butler and Major Bradford take pains to point out, the R.A.F. "gave proof of courage and devotion unsurpassed by any Service in any period of our history." How many of us realize that "at least 2,000 enemy aircraft were shot down by the R.A.F. and French air forces during those few long days of early summer which witnessed the German onslaught upon France," compared with a total of 1,733 destroyed during the more-publicized Battle of Britain which followed?

Perhaps the most refreshing thing about this book is that, although it describes the thoughts and experiences of the lowliest soldiers, sailors and airmen of the B.E.F. and of the civilians who sailed out in the "little ships" to carry them to safety, it does so with a dignity and pride befitting their achievements while never losing its character of down-to-earth realism. It is, consequently, true-to-life, vivid and very readable.

J. W. R. T.

Slipstream—the Autobiography of an Air Craftsman. By Eugene E. Wilson. 310 pp. and index. (McGraw-Hill Book Company Inc., New York and London; $4.50.)

Mr. Wilson gives us the inside story of American aeronautical development in the last quarter century, based on his own wide experience in the United States Navy and aircraft industry, the object of the exercise being to emphasize that the best way of ensuring peace is through air power.

Inevitably, the story suffers from personal prejudices, especially as Mr. Wilson's first experience of aviation was as Chief of the Engine Section of the Navy Bureau of Aeronautics under the redoubtable Admiral William Moffett, where he was a by no means disinterested witness of the inter-Service battle between naval aviation under his chief and the Air Force led by "Billy" Mitchell. Nevertheless, one can only respect his opinions, while regarding them strictly as such.

The chapters dealing with his decision to "learn the other fellow's job" by becoming a pilot at the age of 39, his part in the conception and organization of the first carrier task force, and his subsequent career in industry—in which he rose to be President of the great United Aircraft Corporation and Chairman of the United States Aircraft Industry Association—are full of interest, giving a clear, fascinating picture of the difficulties and trials which beset both the American Services and aircraft manufacturers in the years between wars.

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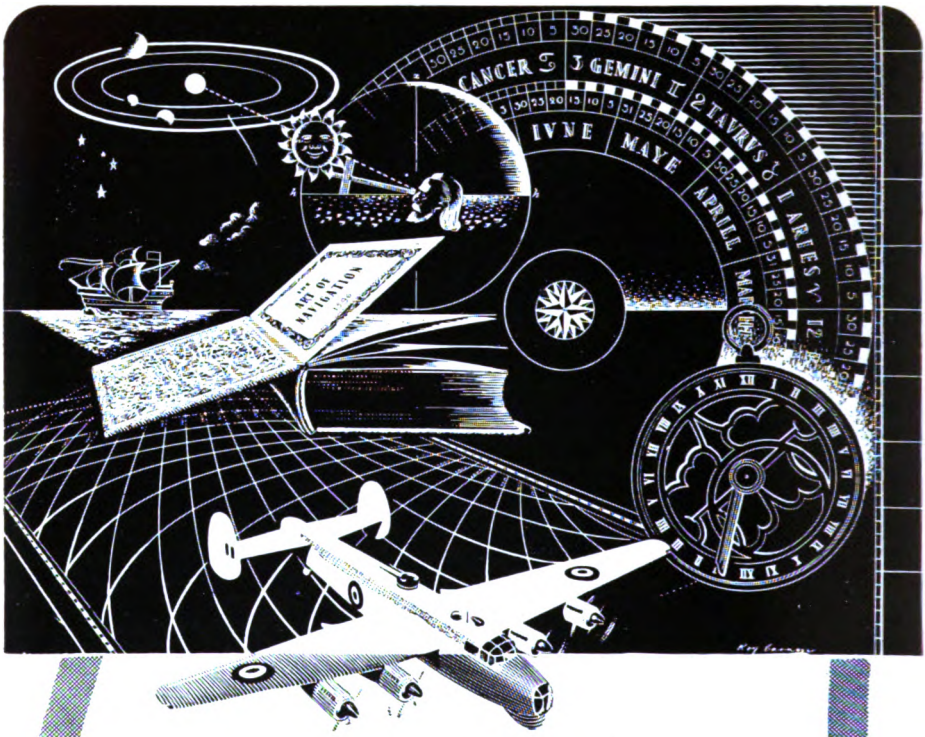

Navigation—old and new

It is far from the days when the early navigators attempted to determine their position by cross staff, astrolabe and zodiac circle. It is more than 200 years since chronometer and octant first guided the ships of the world. Now, with modern navigational aids the Avro Shackleton, patrolling far from friendly shores, can carry out devastating attacks on objectives located with uncanny accuracy.

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To sum up, *Slipstream* is very American, containing a great deal of common sense, plenty of criticism, sound descriptions of how and why many of the more important United States aeronautical developments took place, and much well-justified pride in achievement, seldom tempered with an overdose of modesty—perhaps not everybody's ideal, but a mixture always guaranteed to provide good value for the discerning reader.

J. W. R. T.

I Was There. By Admiral William D. Leahy, with a foreword by President Truman. (Gollancz; 25s.)

Admiral Leahy had unrivalled opportunities during the war to observe the leaders of the Allies, and to participate in nearly all the conferences which shaped the course of the Second World War. He was Chief of Staff to President Roosevelt, an appointment unique in American history, from July, 1942, until the latter's death in 1945. He was retained in his post by President Truman, finally retiring in 1949. Previous to this he had held the very difficult position of United States' ambassador to Vichy France. A book coming from the pen of such a man promises to be of great interest, if not a great book. The tragedy of Admiral Leahy's memoirs is that most of the information they contain has been published before, and their author is no historian. Yet the book has the merit of saying what it has to say in a blunt, unvarnished way that succeeds in arousing the reader.

The book can hardly be read through from beginning to end, but as the foreword explains, it is little more than a series of notes Admiral Leahy took as the war progressed. This may occasion the disjointed form it has. Advantage of this could have been taken to cut out a great deal of American domestic matters without making the book disjointed and parts meaningless to British readers. It falls, naturally, into two sections, the first dealing with his stay at Vichy, and the second mainly with Allied strategy from 1942 onwards.

The part dealing with his post at Vichy is the more interesting. He paints members of that régime in a more kindly light than has hitherto been the case. He was at first somewhat impressed by Marshal Pétain, but as his experience of his government grew, he was forced to modify his impression, and concluded: "The Government of France, headed by a feeble, frightened old man, surrounded by self-seeking conspirators, is altogether controlled by a group which, probably for its own safety, is devoted to the Axis philosophy." He nicknamed Darlan "Pop-eye," and does not appear to have found him uncongenial. He is sympathetic towards General Weygand, for whom he seems to have had a high regard. He did his best to persuade him to return to North Africa in 1942 and accept command there under Allied auspices. Weygand, however, "declined to discuss our proposition."

The first reaction of a British reader to the later part of the book is one of irritation, and then wonderment how so liberal-minded a statesman as President Roosevelt could have chosen so reactionary a figure to be his Chief of Staff. The reason probably lies in Admiral Leahy's prejudices, which his book makes abundantly plain. He appears to have little admiration for anyone except President Roosevelt, and he gives, if the reader will search for it, an intimate study of the President from the time he became closely associated with him as his Chief of Staff. Of all the other leaders, military as well as political, only three receive more than a passing comment. Russia and Stalin he could understand, because one of the few things he appreciates is military might. He mentions the late Field-Marshal Sir John Dill as one whom he would have accepted for the Commander of the Allied forces which were to undertake the invasion of France, and he describes Admiral Sir Andrew Cunningham more than once as a "brilliant" naval commander.

It is clear from his pages that he had little knowledge of the R.A.F., and his remarks, while he was at Vichy, that it ought to stop advertising itself, are scarcely in the best of taste. His views on the uses of air power are his own, but he should have guarded against being proved completely wrong from an insufficiency of knowledge. He considered that a separate air force (as demonstrated by the R.A.F.) was a misuse of air power. The greatest tribute to the efficiency and effectiveness of the Royal Air Force is that the United States Air Force has been established as a separate service in exactly the same fashion as its British counterpart. He obviously did not realize that the Royal Navy had its own air branch at the time of the sinking of the *Repulse* and *Prince of Wales*, although its victory at Taranto, the year before, had shown what its carrier aircraft could do to ships in harbour. The Japanese Navy noted the results, even if he did not.

Every American author who has dealt with Allied strategy during the war years has at least given the impression that the British were lukewarm in their support of the cross-Channel invasion of Europe to begin a second front. Whether this is so must remain until an authoritative work by a British personality concerned appears. It is obvious in the light of after events and from Admiral Leahy's pages that the Americans played into the hands of the Russians. Tradition dies hard in foreign policy, and the U.S.S.R. took on the mantle

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dropped by the Romanovs. Thus, when the Americans appealed to the Russians for support in getting a landing in the South of France instead of an attack through the Balkans, as proposed by Mr. Churchill, the Russians were only too willing to side with the Americans; they were left a clear field in the Balkans, and with results that are patent to everyone.

By what standards can this book be judged? Its content is hardly novel, nor its style brilliant. It cannot be claimed that it gives penetrating portraits of the Allied war leaders. It does, however, provide an insight to the mind of the type of American Admiral Leahy represents, and is of value for that. Furthermore, it will provide the student of the Second World War with a reference book of the main decisions taken by the Allied war leaders at most of their conferences.

T. M.

BOOKS RECOMMENDED

IMPERIAL DEFENCE COLLEGE

The list of books for pre-course reading by officers who are going to the Imperial Defence College (reproduced in the April, 1950, number of THE ROYAL AIR FORCE QUARTERLY), has recently been revised by A.M.O. A.459 of 1950. The revised list is reproduced below in two categories as before: Category "A" comprising "prescribed," and Category "B" comprising "recommended" books.

These books will also be found useful to serious students of the subjects covered, whether they expect to go to the Imperial Defence College or not. Most of the books in this list are stocked by the R.A.F. Central Library at Cosford; and they may be borrowed from there by other R.A.F. stations on application to station education officers.

CATEGORY "A"

The Commonwealth and the Nations. By N. Mansergh. (R.I.I.A.)
The West at Bay. By B. Ward. (Allen & Unwin.)
Modern Arms and Free Men. By V. Bush. (Heinemann.)
Stalin. By I. Deutscher. (Cumberlege.)
The Theory and Practice of Communism. By H. Carew Hunt. (Bles.)

CATEGORY "B"

The Gathering Storm. By W. Churchill. (Cassells.)
Their Finest Hour. By W. Churchill. (Cassells.)
The Grand Alliance. By W. Churchill. (Cassells.)
Statesmen and Sea Power. By Sir H. Richmond. (O.U.P.)
Air Power in War. By Lord Tedder. (Allen & Unwin.)
The Second World War. By C. Falls (Methuen.)
On Active Service in Peace and War. By H. Stimson. (Harper.)
The White House Papers of Harry Hopkins. By R. Sherwood (Eyre & Spottiswoode.)
Authority and the Individual. By Lord Russell. (Allen & Unwin.)
The Study of History. By A. Toynbee. (O.U.P.)
The Congress of Vienna. By H. Nicholson. (Constable.)
Munich. By J. W. Wheeler-Bennett. (MacMillan.)
The Years of Victory. By A. Bryant. (Collins.)
The Years of Endurance. By A. Bryant. (Collins).
English Saga. By A. Bryant. (Collins.)
British History of the 19th Century and After. By G. Trevelyan (Longmans.)
English Social History. By G. Trevelyan. (Longmans.)
The Expansion of Europe into the Far East. By Sir J. Pratt. (Sylvan Press.)
The Situation in Asia. By O. Lattimore. (Little, Brown & Co.)
A Short History of the Middle East. By G. Kirk. (Methuen.)
European Movement and the Council of Europe. (Hutchinson.)
The Americans. By G. Gorer. (Gresset Press.)
A Short History of the American People. By H. Faulkner. (Allen & Unwin.)
Europe in the 19th and 20th Centuries. By Grant & Temperley. (Longmans.)
British Achievement in India. By H. Rawlinson. (Wm. Hodge.)

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The following authoritative books are also recommended for general reading:

COMMONWEALTH AND EMPIRE

The Adaptable Commonwealth. A summary of the proceedings of the Commonwealth Relations Conference, 1949, held at Bigwin Inn, Ontario, Canada, from 8th to 18th September, 1949. By F. H. Seward. Foreword by Rt. Hon. R. A. Butler. 62 pp. (London: Royal Institute of International Affairs, 1950; 2s.)

The British Commonwealth. (A Background Handbook.) By Jack Simmons. 51 pp., maps and bibliography. (London: Bureau of Current Affairs, 1948; 2s.)

Strategic Colonies and their Future. The problems of Hong Kong, Gibraltar, Malta and Cyprus. By the Fabian Colonial Bureau, with an Introduction by A. Creech Jones and maps by J. F. Horrabin. 36 pp. and maps. (London: Fabian Publications; 1s. 6d.)

DEFENCE

The Question of Defence. By Cyril Falls. 30 pp., illustrated with maps. (London: Longmans, 1947; 1s.)

Defence of the West. By B. H. Liddell Hart. (London: Cassell, 1950; 12s. 6d.)

British Security. A Report by a Chatham House Study Group. 176 pp. (London: Royal Institute of International Affairs, 1946; 8s. 6d.)

FOREIGN POLICY, ETC.

United Kingdom Policy, Foreign, Strategic, Economic. Appreciations by Professor Sir Charles Webster, Major-General Sir Ian Jacob and E. A. G. Robinson. 101 pp. and tables. (London: Royal Institute of International Affairs, 1950; 4s.)

WESTERN UNION

Western European Union. Implication for the United Kingdom. 126 pp. (London: Royal Institute of International Affairs, 1949; 5s.)

PACTS AND TREATIES

The North Atlantic Treaty, the Brussels Treaty and the Charter of the United Nations. viii and 75 pp. (London: Stevens, for the London Institute of World Affairs, 1950; 10s. 6d.)

Atlantic Pact, Commonwealth and United Nations. By Andrew Boyd and William Metson. 100 pp. (London: Hutchinson for U.N.A., 1949; 8s. 6d.)

WORLD AFFAIRS

The Big Three: The United States, Britain and Russia. By D. J. Dallin. ix and 292 pp. (Connecticut: Yale University Press, 1945, $2.75.)

GERMANY

The Origins of Modern Germany. By G. Barraclough. 48 pp. (Oxford: Blackwell, 1946; 21s.)

Republican Germany. A Political and Economic Study. By H. Quigley and R. T. Clark. 318 pp. (London: Methuen, 1928; 15s.)

Russian Zone. By Gordon Schaffer. 192 pp. (London: Allen & Unwin, 1947; 9s. 6d.)

Germany. Bridge or Battle Ground? By James P. Warburg. 386 pp. (London: Heinemann, 1947; 15s.)

WARFARE

War Between Continents. By F. O. Miksche and E. Combaux. 211 pp. and maps. London: Faber, 1948; 15s.)

ATOMIC ENERGY

Military and Political Consequences of Atomic Energy. By Professor P. M. S. Blackett. viii and 216 pp., tables and bibliography. (London: Turnstile Press, 1948; 12s. 6d.)

Atomic Challenge. A symposium with commentaries by students of different nationalities. By J. D. Cockcroft and others. x and 180 pp. (London: Winchester Publications, 1947; 8s. 6d.)

Atomic Energy. Its International Implications. 128 pp., with bibliography and tables. (London: Royal Institute of International Affairs, 1948; 4s.)

The Atomic Bomb in World Politics. By Edward A. Shils. 79 pp. (London: N.P.C., 1948; 2s.)

The Atomic Problem. By J. M. Spaight. viii and 56 pp. (London: Barron, 1948; 3s. 6d.)

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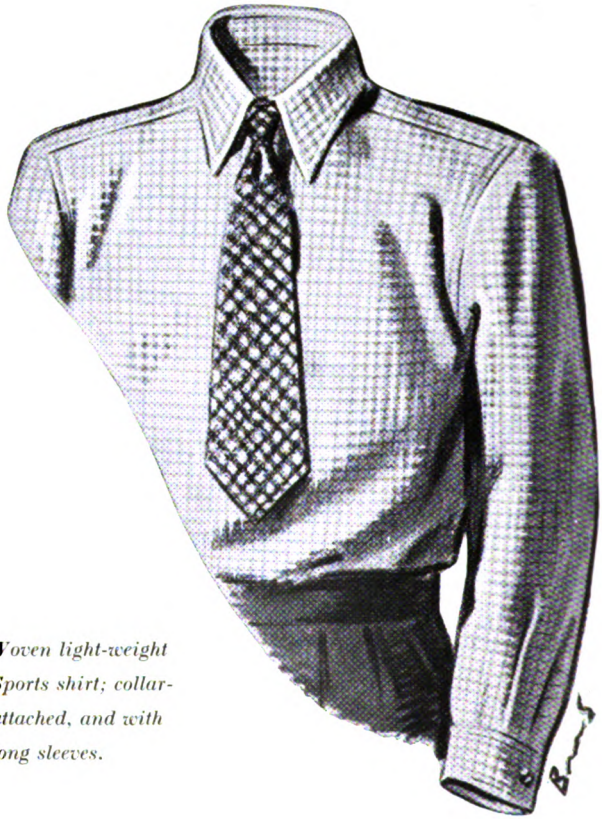

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NEW BOOKS

DEFENCE

Planning National Defense, 1950-1970. (Library of Congress, Legislative Reference Service, Public Affairs Bulletin No. 75). By S. A. Devan. (Library of Congress, 1949; Washington, D.C.)

Defence of the West. By B. H. Liddell Hart. Is an expert appreciation of the strategical and tactical situation of the Western Democracies in the face of the presumed Communist threat from the East. (Cassell; 12s. 6d.)

SECOND WORLD WAR

The Second World War, Vol. III, "The Grand Alliance." By Winston S. Churchill (Cassell; 25s.)

A Short Story of 21st Army Group. By H. Darby and M. Cunliffe. Gale & Polden Ltd., 1949.)

The R.A.F. in the World War, Vol IV. By Norman Macmillan. Illus. (Harrap; 15s.) Concludes Captain Macmillan's survey of the work of the Royal Air Force in the Second World War, describes the final campaigns, and analyses the work of Commands.

INTERNATIONAL AFFAIRS

The Coming Defeat of Communism. By James Burnham (author of "The Struggle for the World" (1947), also in the Library). (New York: John Day Co., 1949.)

EUROPE

Germany: What Now? Potsdam (1945) to Partition (1949). By Basil Davidson (with a short bibliography and three appendices. (London: Frederick Muller, 1950.)

Europe and the United States. By V. M. Dean (Research Director, Foreign Policy Association, U.S.A.), with a chapter, "Arms and the North Atlantic Treaty." (New York: Knopf, 1950.)

U.S.A.

The Americans. By Geoffrey Gorer. Is a study of the relationship between national character and political behaviour. (Cresset Press; 12s. 6d. (reprint).)

The United States and the Near East. (Revised Edition). By E. A. Speiser. (Harvard University Press, 1950.)

U.S.S.R.

The Red Army Today. By Louis B. Ely (Colonel, U.S. Army), with a short chapter on Air Support for the Red Army and five appendices of miscellaneous information. (Harrisburg, Pa.: Military Service Publishing Co., 1949.)

The Government of the Soviet Union. (Second Edition, revised and expanded). By S. H. Harper and R. Thompson. Three appendices: (1) Annotated Bibliography. (2) Diagram of the Soviet Government. (3) Constitution of the U.S.S.R. (New York: Van Nostrand, 1949.)

FAR EAST

The New China. By Otto van der Sprenkel, M. Lindsay and R. Guillain. Illustrated. Gives three views on Communist China by foreign observers with first-hand information and contains the new Chinese constitution and some speeches and reports of Mao Tse-tung. (Trustee Press; 8s. 6d.)

The Western World and Japan. By G. B. Sansom. Illustrated. Discusses the economic, political and cultural relations between the Western World and Japan. (Cresset Press; 42s.)

The Making of Pakistan. By R. Symonds. With a short Bibliography. (London: Faber, 1950.)

HOME AFFAIRS

Portrait of a Profession. The Civil Service Tradition. By Sir Edward Bridges (Permanent Secretary to the Treasury). (The Rede Lecture at Cambridge, 1950.) (Cambridge University Press, 1950.)

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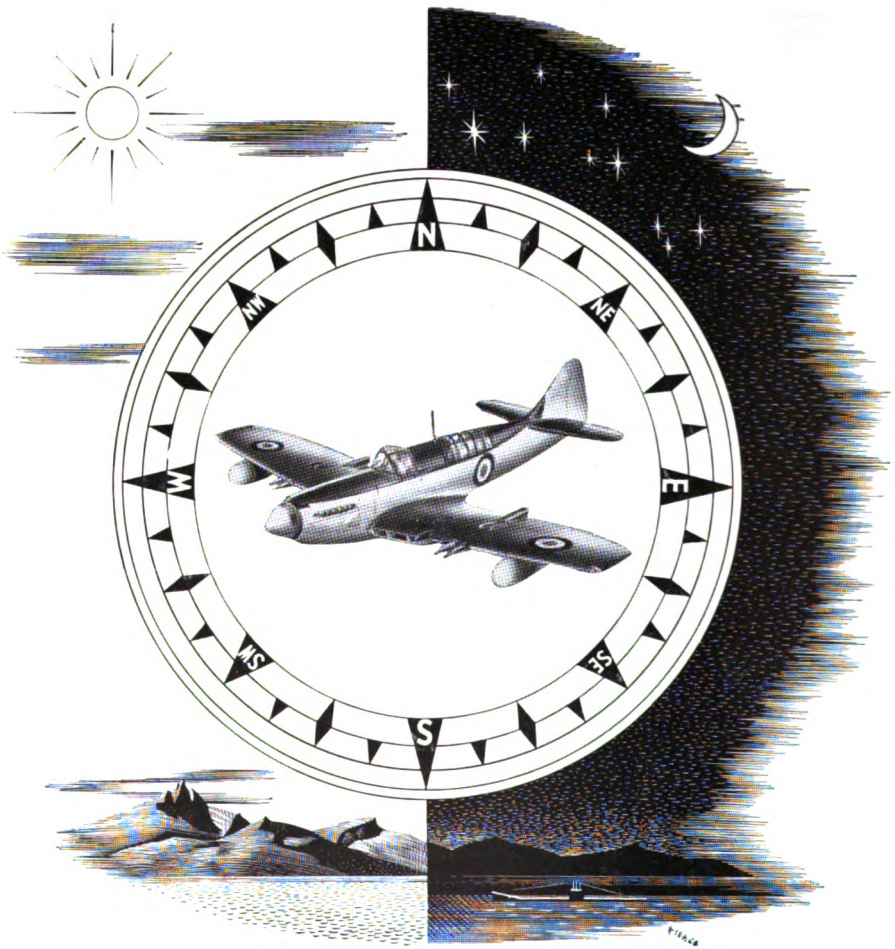

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CONCERNING PERSONNEL

ROYAL AIR FORCE PROMOTIONS AND APPOINTMENTS

Among the promotions and appointments announced by the Air Ministry since the issue of the July number of this journal are the following:

SPECIAL APPOINTMENT

Air Chief Marshal Sir Alec Coryton, K.C.B., K.B.E., A.F.C., to be Chief Executive, Guided Weapons.

HOME COMMANDS

Air Ministry

Air Marshal J. N. Boothman, C.B., D.F.C., A.F.C., as Controller, Supplies (Air).

Air Commodore G. S. Shaw as Director of Personal Services.

Coastal Command

Air Vice-Marshal A. C. Stevens, C.B., as S.A.S.O.

Maintenance Command

Air Commodore H. H. Chapman as Air Officer Commanding No. 43 Group.

Technical Training Command

Air Vice-Marshal B. V. Reynolds, C.B.E., as Air Officer Commanding No. 22 Group.

Transport Command

Air Commodore R. N. Waite, C.B., C.B.E., as A.O.A.

M.E.A.F.

Air Commodore G. P. Chamberlain, C.B., O.B.E., as A.O.A. No. 205 Group.

R.A.F. Staff College, Bracknell

Air Commodore H. E. Nowell, C.B., C.B.E., as Assistant Commandant.

Western Union Military Staff Committee

Air Vice-Marshal G. H. Mills, C.B., D.F.C., as Head of the United Kingdom Military Delegation.

OVERSEAS

South Africa

Air Commodore P. D. Cracroft, A.F.C., as Senior Air Liaison Officer, United Kingdom Services Liaison Staff, South Africa.

Washington

Air Commodore F. R. D. Swain, C.B.E., A.F.C., as S.A.S.O., Air Force Staff, British Joint Services Mission.

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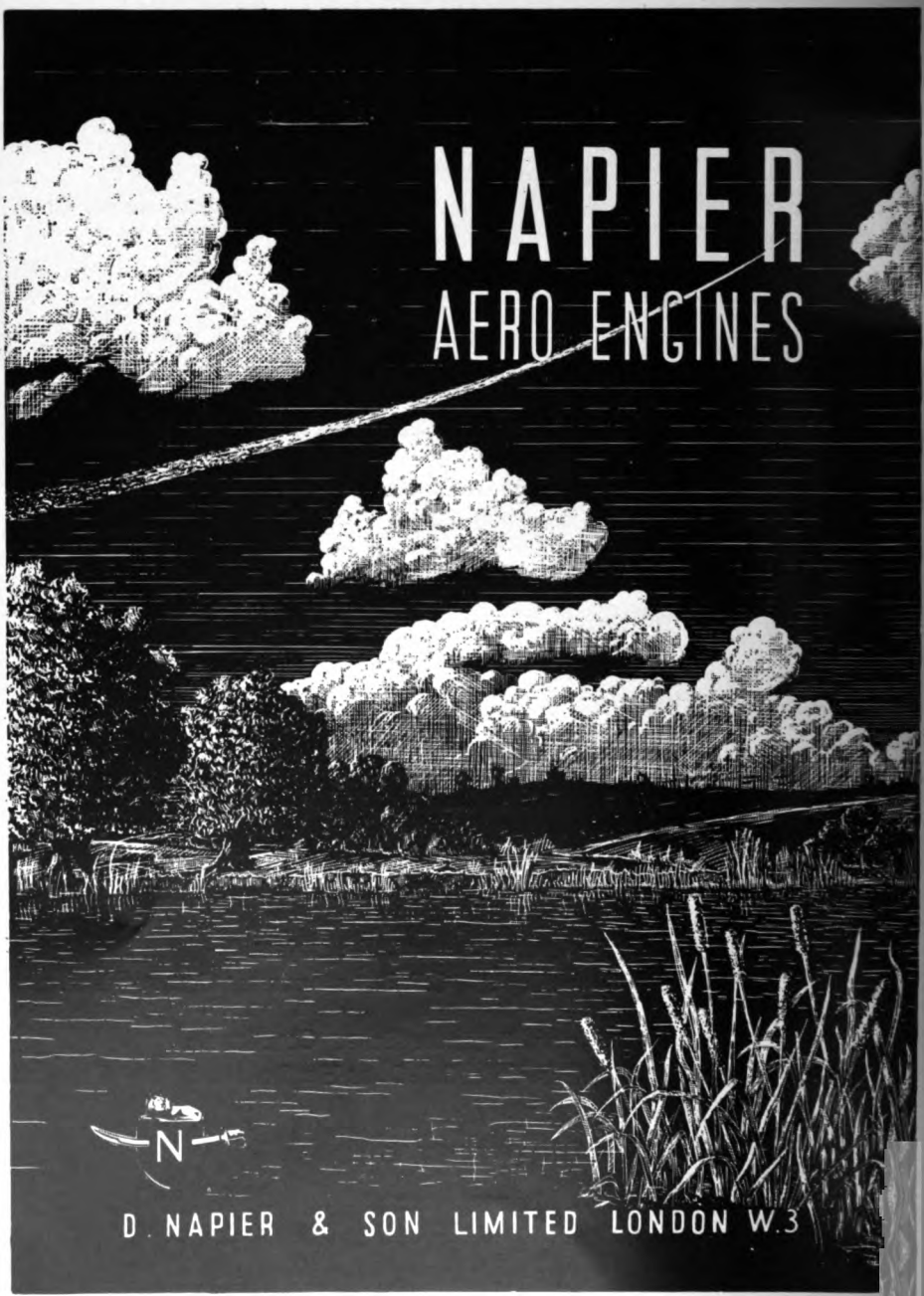

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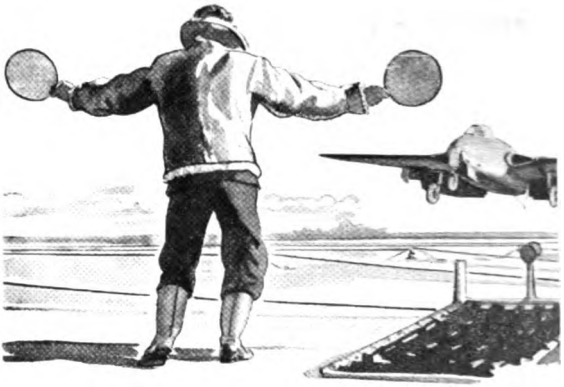

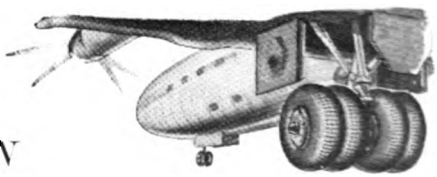

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Assisted by an Air Ministry Advisory Committee of members of the Royal Air Force and Air Forces of the Commonwealth

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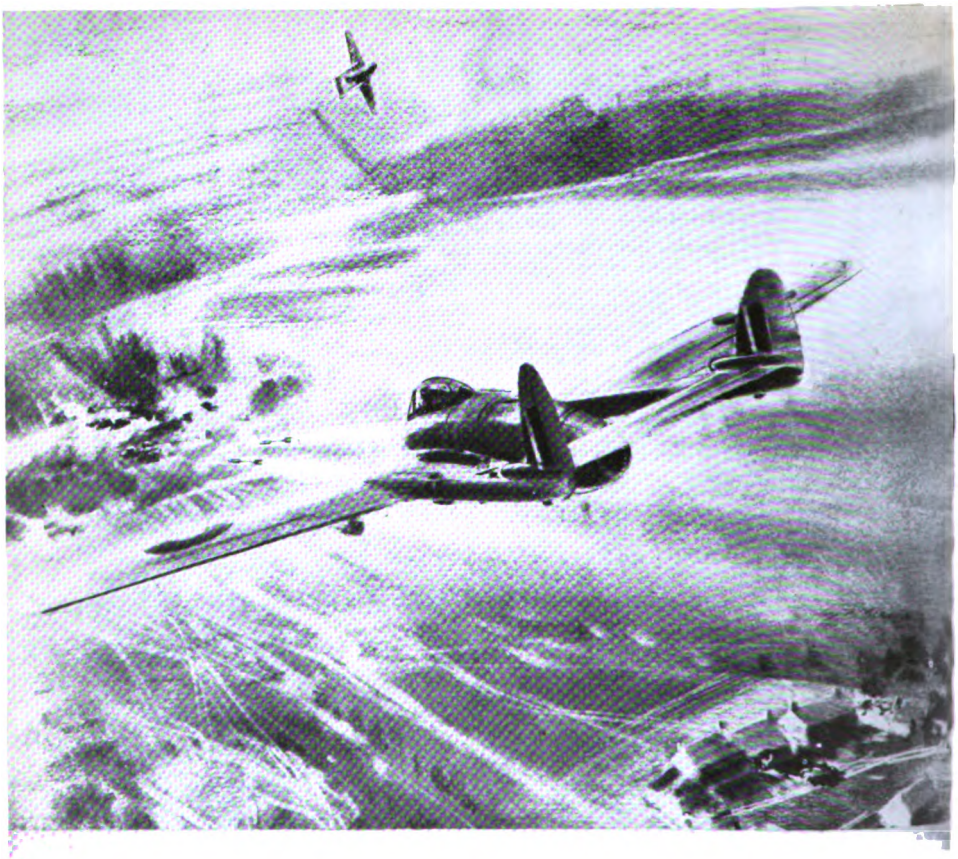

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The views expressed in this Journal are those of the authors, and are not to be construed as official opinions or policies.—
EDITOR.

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[Air Ministry photo

ONE OF THE PLACES WHERE COMMUNISM HAS STARTED A "HOT WAR"

The Under-Secretary of State for Air, Mr. Aidan Crawley, moving under escort up to a forward area to see a patrol moving off on a two-day operation, during his visit to No. 93 Squadron of the R.A.F. Regiment (Malaya), now engaged on active operations in the jungle

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EDITORIAL

NEW WEAPONS AND FUTURE WAR

AT the end of World War I the great possibilities of the development of air power as an offensive weapon led many to believe that in any future war victory would be won by the air-arm; that the part played by navies and armies would be so insignificant as to render them almost obsolescent. This fallacy was destroyed in World War II, which proved that strength in war lies not in any one weapon, arm or service, but in the full and close collaboration of all, directed to one end.

Although the success of operations on the sea or the land is now absolutely dependent on superiority in the air, as exemplified by the loss of the battleships *Prince of Wales* and *Repulse* and the campaign in Greece; navies and armies are still necessary to withstand the assaults of the enemies' surface forces and the *coup de grâce* cannot be delivered in the air any more than on the sea.

Since the end of World War II the possibilities of the development of new and improved weapons has again led to wild flights of imagination in the realms of "push-button" warfare.

Alarmists have conjured up horrific pictures of scientists in vast underground caverns watching, on huge television screens, the destruction and desolation being caused on the earth's surface above them, as from time to time they move switches which release pilotless-aircraft or rockets, then turning small wheels guide them in the initial stage of their flight, after which the "electronic brain" in these new weapons takes over, enabling each to find and destroy its own target, be it some obsolescent bomber or a distant city. Needless to say, this is utter nonsense. Pilotless aircraft and rockets have not yet reached this stage of perfection, any more than the use of television for war purposes. It is as fallacious as the earlier belief that World War II would be won by Air Power alone. Much harm can be done by such imaginative thinking.

There are, however, new weapons and much improved weapons of war now available for use in another world war, which seems day by day to be drawing nearer. The opposing nations are building up stock piles of atomic bombs and manufacturing hydrogen bombs; new types of rockets and pilotless aircraft are available; greatly improved submarines and small, fast, surface vessels to deal with them are in readiness; the means of waging biological warfare, with all its horrors, are possessed by the potential aggressor and the Western Powers, and a limitless number of improvements have been made in earlier types of weapons of war. All of these must be taken into account when considering any likely changes between World War II and the new war with which the world is now threatened.

In the past, when a new weapon has been discovered, measures have been taken to counter it. Security necessitates that modern developments of this nature remain to a great extent secret and therefore much must be left to speculation. There are other measures taken in our defence which are well known, and it would appear that the usefulness of some of them depend upon the distance of the enemy's bases of operations from this country. The introduction of the jet-engine and appreciably increased speeds of our fighters compared with bomber aircraft speeds, coupled with the fact that the fighter's high rate of fuel consumption prevents the escorting of bombers over long

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distances, makes them more vulnerable to our defending fighters which, with modern rocket shells, would cause havoc once interception had been achieved.

Again, "distance lends enchantment" when we study the problem of possible attack by rockets, which ascend seventy-five miles above the earth's surface and descend upon us at a speed of some 3,000 miles per hour. This is a formidable weapon at short ranges, but at long ranges is sufficiently inaccurate to make it dangerous only to an extremely large target, and there is no possibility at present of its having an atomic warhead.

Maybe there is small comfort in this when we realize that their destructive power will certainly be greater than the V2 of the last war, and no known defence has been developed against this form of attack.

The atomic bomb must still be delivered by bomber aircraft to its target and the improved defence (apart from that developed in anti-aircraft weapons) has already been stated. There is, however, still the certainty that despite this some will get through. The results produced will vary according to the element in which it is exploded. If exploded in the water, as at Bikini, vast areas of adjoining land would become uninhabitable for a very long time. If exploded in the air, as at Hiroshima, the destruction of buildings is extensive, and unless adequate warning is given and adequate shelter is available, the casualty rate will be extremely high, but decontamination against radio-activity more easily achieved. To deal with such possibilities it must be obvious that a highly trained and fully manned civil defence force is an urgent necessity. The foregoing are all matters which have been discussed in Parliament, referred to in public speeches by statesmen or our Service chiefs, or published in the Press and elsewhere on frequent occasions. There are no new disclosures in what we have said about "New Weapons and Future War"; it is all as well known as the presence on the continent of overwhelmingly superior Russian forces faced by a hopelessly inadequate force of the Western Powers. With the U.S.S.R. planning even bigger military forces and increasing the development of her atomic industry, it is unbelievable that vast sections of an intelligent people can still remain apathetic to the call for volunteers to form our defence forces or fill the thousands of vacancies in our Civil Defence Services. This island of ours is a very vulnerable target to atomic attack. With its thickly populated industrial areas with little chance of dispersal, we cannot afford to be caught unprepared. Is the instinct of self-preservation so dead in us that even when faced with the prospect of destruction at an all-too-early date, we are not stirred, each one of us, to do something in our own defence? Those who still remember our past achievements, our building of a great Empire, our steady climb to become the greatest world power, must be filled with wonder and amazement at our petty political bickerings and lack of co-ordinated action in this grave hour of our peril.

As we write (12th November, 1950) thousands of our countrymen stand in silence, paying homage to those who made the supreme sacrifice in two world wars that we might remain a free people to follow our own way of life. For a third time our freedom is now threatened; the responsibility has been passed on to us by the countless thousands of our comrades who died. The most effective weapons in war are, and always will be, a high standard of national morale, patriotism and the will to serve.

The cause for which we are likely to fight is an ancient one with us and the finest any man could have: "For our faith and the right to be free."

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LET US MAKE THE ROYAL AIR FORCE SUPREME

By Air Chief Marshal Sir Guy Garrod, G.B.E., K.C.B., M.C., D.F.C., F.R.Ae.S.

THE Air Force has not yet completed its period of peace-time reconstruction. It is still feeling the effects of the shock of post-war demobilization, followed by financial restrictions imposed on the Fighting Services. Indeed its manning problems are largely the legacy of policies adopted under the pressure of war-time expansion. What are the major needs today for completing the process of making the Royal Air Force unquestionably supreme in efficiency and power?

MANNING

Overriding all other difficulties is the problem of manning. Quite early in the last war it was decided to give up apprentice training at Halton and Cranwell in order to use the capacity for training the large numbers of tradesmen needed quickly for expansion. It must be admitted that, if this had not been done, the Service would not have been able to expand so quickly. It is a very potent argument in war-time that nothing else matters but winning the war, and that the needs of the post-war Air Force can be faced after victory has made these needs relevant. But now we realize that it is useless to win the war if we cannot also win the peace.

The apprentice training at Halton and Cranwell has always been the backbone of the technical efficiency of the Air Force. To abandon this training in war-time inevitably condemned the post-war Air Force to a crushing deficiency of technical N.C.Os. and of young airmen in the most highly skilled trades. But worse than this, recruiting on regular long-term engagements was also discontinued during the war. As a result, when demobilization took place, the most valuable N.C.Os. and tradesmen literally melted away. It is no remedy to fill the gaps with National Service men, even on a two-year period of service. However high their quality they cannot pay a fruitful dividend on the effort required to train them in the highest trades.

No, the Royal Air Force, like the Royal Navy (which, incidentally, never reduced its apprentice training during the war) requires its tradesmen to be volunteers who have adopted the Service for their life's career and hope to remain serving until they qualify for pension. Fortunately the new scales of pay and the new trade structure in the Air Force provide conditions which are financially attractive and give scope for ambition and a good career. The obligation now rests with all ranks in the Service, as well as all who have left the Service, to see that men of the highest quality volunteer for the gaps that are waiting to be filled. What an opportunity for an enterprising youngster on the threshold of life, or for a skilled man (and there are many) who has left the Service and finds that the comradeship and friendliness of the Air Force has no counterpart in civilian life! This is not a matter solely, or even mainly, for the recruiting offices. The best recruiting agencies are the officers and airmen themselves, for by them (whether serving or retired) will the Service be judged and by the *esprit de corps* which they radiate.

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BOMBER COMMAND

Next in importance to the manning problem are the needs of Bomber Command. It is strange how often men fail to realize, even within the Service itself, that an air force without a strong Bomber Command is no air force at all. When there is pressure to reduce expenditure on defence, the cry is always for economy on the bombers so long as we retain enough fighters to protect these islands from hostile air attack. There is no doubt that the salvation given to us by the Battle of Britain has misled many to believe that fighters provide the decisive element in air defence. The truth is that it was Bomber Command by its relentless air offensive against bitter opposition which in the long run gave us air superiority not only over the United Kingdom but also over the whole of Western Europe. Lord Tedder has used the simile of the boxer with his guard, Fighter Command, and his punch, Bomber Command. Air Marshal Sir Hugh Lloyd, at a recent dinner of the R.A.F. Reserves Club, used the simile of the football team. The game might be lost if there were no full backs and goalkeeper, but it could never be won with a side of eleven goalkeepers. It is the forwards who score the goals. It is the bombers that exercise air power.

And so the suggestion to leave the strategic air offensive to the U.S. Air Force needs careful qualification. By all means let us "integrate" or "harmonize" Western defence. Let France take the main shock of land defence with her army and tactical air force. Let Britain provide the main strength in air defence and in anti-submarine warfare by sea and air. Let the United States provide the massive air bombardment of the enemy's war potential. But do not forget that Britain requires bombers of very long range and striking power, not only for the role of air defence mentioned above, but also for the protection of the Commonwealth outside the spheres of Western Union and the Atlantic Pact.

It is quite clear that China's aim, with the aid of Russia, is to absorb Tibet and then to move against the sub-continent of India. Now any overland invasion of India must depend for its support on long and vulnerable communications, and must finally enter India through narrow defiles. These conditions are ideal for a powerful bomber force of sufficient range so to weaken the invading army during its long approach march that it can be defeated in the land battle as it debouches from the mountain passes on to the plains of India. Should China, with Russian aid, be able to launch a heavy air bombardment against India's industrial economy, it will again be British bombers of very long range and power that can alone stifle such attacks at their source.

The same picture applies to the Middle East. A Russian land attack would depend on long communications exposed to air attack right back to their source, provided our bombers had the range. A Russian strategic air offensive against Egypt would require bombers of greater range than the enemy's to counter it.

On no account therefore can we afford to neglect the development and manufacture in British factories of the most powerful and up-to-date types of very long range bombers, so that they can be supplied to Bomber Command and to the other air forces of the British Commonwealth. This is one of the most pressing needs, in order to make the Air Force supreme. Yet, no firm assurance has been given that it will be done. We have been told in Parliament that development work is continuing, but nothing has been promised about equipping the Air Force with any bomber of greater range and power than the Canberra. The Canberra has magnificent promise, but has not the reach or punch for the strategic defence of India or the Middle East, or indeed of the United Kingdom.

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TRANSPORT COMMAND

One of the outstanding lessons of the last war was that heavy transport aircraft are a vital factor in the exercise of air power. What is the sense in having squadrons whose aircraft can move to any part of the Commonwealth at 500 miles an hour if you cannot move their maintenance personnel and equipment at the same speed? You can greatly reduce your stock of spare parts and maintenance equipment in all Commands if you have a regular service of air transport from Britain to every Command overseas and within the Commands themselves. The occasions for airborne operations may be few, but the demand for air supply is unceasing. When the Fourteenth Army made its dash to Rangoon in 1945 it was supplied entirely by air. Before this, in 1944, the army had been able to stand fast after being forced by the Japanese into isolated pockets, because it was supplied by air after its land communications had been severed. This was the turning-point in the campaign. More recently, in the cold war against Russia, the Berlin air lift saved Western Europe from what would otherwise have been the first stage in the collapse of its defences. Finally, the United Nations forces in Korea would have been faced with an impossible task without the transport squadrons of the United States Air Force.

There is every indication that an outstanding feature of the next war will be a strategy of infiltration. First, there will be infiltration into the minds of the enemy so as to undermine their will to fight. This is the greatest danger of the present time, especially on the Continent of Europe, where it is often asked: "What is the use of resisting the inevitable?"

Then when the physical attack is launched there will be infiltration by men camouflaged as refugees as well as by fifth columns previously organized. The defending army must be prepared to form pockets or areas of resistance, cut off from inter-communication by land. Victory in the land battle will then go to the side which possesses air superiority and is able to supply its land forces by air.

In spite of all these clear lessons our Transport Command has been cut down to a dangerous level. It is urgently necessary that it should be restored to sufficient strength to ensure that personnel and equipment and supplies, not only for the Air Force but also for the Army and Navy, can travel by air whenever the urgency requires it, or when communications by land and sea are severed or insecure.

At the same time everything must be done to build up and maintain in operation the widest possible network of civilian air charter companies, as a reserve for Transport Command in war. The two big Corporations, B.O.A.C. and B.E.A., are not enough. If British air power is to be strong and healthy it must rest on a flourishing civil aviation, just as the Royal Navy draws its strength from the Merchant Service and the traditional love of the sea among our people.

Let us hope, therefore, that our national resources in transport aircraft are quickly built up again so that our air power may be properly balanced in all its aspects, and our manufacturing capacity as well as our operational skill may be kept fully alive and progressive. We are still suffering from our self-denying decision made during the war to leave the production of transport aircraft to the United States. It takes many years to recapture a manufacturing skill of this kind, if it is once allowed to decline. On no account must we allow the revival in our manufacture of transport aircraft to be stifled. On no account must we forget that the same principle applies to the heavy bomber also, with the important addition that the Royal Air Force without heavy bombers would be like the British lion without claws or teeth.

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FIGHTER COMMAND

In respect of aircraft performance, Fighter Command is equipped with the best aircraft in the world. This fact is often used to give us a false sense of security, as if air power and air defence can be divided into segments, and as if it is sufficient to be strong in that segment which is responsible for the local defence of the home base. But even though the quality of our fighters is superb, the quantity in the front line and immediate reserves should be increased, if all the defence sectors are to be adequately covered. Equally important is the manning of the Fighter Control units and the Royal Observer Corps, without which the fighter squadrons, however efficient, cannot make contact with the enemy. Here is a problem depending for its solution on a greater awareness of urgency among our people. If only more could be told about the location and achievements of individual Fighter squadrons and of the reporting system within each sector, a deeper sense of personal responsibility for filling the gaps might be aroused in the local population.

We must not rest until our strength in fighters is sufficient to cover all sectors, and our reporting system is fully manned. Only then will the Royal Air Force be supreme in this aspect of the air defence of this country.

COASTAL COMMAND

After the air threat in order of time, but equal in order of importance, comes the threat from the submarine of the future, a vessel of far greater performance than anything we have seen hitherto, in fact an underwater cruiser of world-wide range and high speed. More than ever will the defeat of this threat depend on aircraft. Even in the last war more enemy submarines were sunk by air attack than by surface vessels. And yet Coastal Command has shrunk to a mere shadow of its war-time strength. From what was seen at the last S.B.A.C. Display at Farnborough, the development of new carrier-borne types of anti-submarine aircraft has outstripped that of shore-based types. Yet it was the long-range aircraft of Coastal Command that proved decisive in the Battle of the Atlantic. The Shackleton looks as if it is able to carry the mass of specialized equipment needed by the submarine hunter—depth charges, mines, torpedoes, sonobuoys and radar—but it was not primarily designed for Coastal Command duties, as the Fairey and Blackburn types were designed for the Fleet Air Arm. To make the Air Force supreme in the task, which it shares with the Navy, of protecting our sea communications, we must expand Coastal Command as well as pressing on with the development of the most advanced aircraft for its use together with the technical devices for locating, pinning down and destroying the enemy's underwater cruisers.

OTHER MEASURES

There are other measures which should be taken to strengthen the bonds between the Royal Air Force and the youth of Great Britain. The Air Ministry has recently taken a wise and far-sighted step in adopting officially the Flying Scholarship Scheme which was devised by the Air League of the British Empire. A sum of £30,000 has been set aside this year for the flying training of selected A.T.C. cadets up to the standard of the civilian pilot's licence. This sum is sufficient for something between 200 and 250 scholarships. Here is a scheme which promotes enthusiasm in the Air Training Corps, greatly assists the Flying Clubs where the training is given, and stimulates recruiting for the Royal Air Force. It is a scheme which should be greatly expanded so as to make flying

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scholarships available to every boy of sufficiently high standard from all the Public Schools and Grammar Schools. A high proportion of those who had completed their training could be relied upon to join one of the Royal Air Force Reserves. The remainder would be registered, with a report on the flying efficiency that they had attained. So would the reserves be strengthened and, in addition, there would be built up a civilian reserve which would automatically nourish the official reserves on mobilization. There was a nation-wide scheme of this nature in the United States, called the Civilian Pilot Training Scheme, which captured the enthusiasm of the best young men in all the American High Schools and Universities during the years before America entered the last war. Without this preparatory work the U.S. Air Force could never have expanded as it did. The C.P.T. Scheme skimmed the cream of the best potential pilots and had them already tested and partly trained. And this was done using light aircraft, without causing any strain on Service resources.

Under such a scheme in this country every National Service man volunteering for the Air Force for aircrew duties could be given preliminary flying training, provided he was of sufficiently high quality. He could then continue his flying training in an Air Force school, and on completion of his National Service augment our fund of aircrew reserves. The University Air Squadrons have always paid handsome dividends, because of the high quality of their members. What is now desired is an extension of these facilities and of the Flying Scholarship Scheme, so that every suitable young man wishing to qualify and be earmarked for aircrew service in war can have an opportunity of doing so. At present the Air Force is losing far too many fine young men who are attracted for their National Service to the Army by the good prospect of a commission, but who would greatly prefer to come to the Air Force if they could be assured of receiving flying training, or if they had already had an opportunity of flying training under a nation-wide Scholarship Scheme.

CONCLUSION

And so the theme of this article comes back to its starting point. In the Royal Air Force it is quality that counts. Quantity without quality is useless, in fact it can be a positive danger. In air operations the members of an aircrew face mortal hazards in far greater isolation than the majority of those in the other Services. The parallel in the Army and Navy would be if they were composed entirely of Commando units and submarines and aircraft carrier flights. So the fighting efficiency of the Air Force depends on the burning, fiery spirit in the minds and hearts of its aircrews. Without quality the aircrews will not only fail to use the power they are handling but will do great harm by its misuse.

How then is the Air Force to make sure that it attracts long-service volunteers of the highest quality, both for its aircrew and its maintenance personnel? Only if it sets out to capture the imagination and the affection of the people of all ages, so that it is enshrined in their hearts, and parents are proud and eager to encourage their sons to adopt it for their life's career.

November, 1950.

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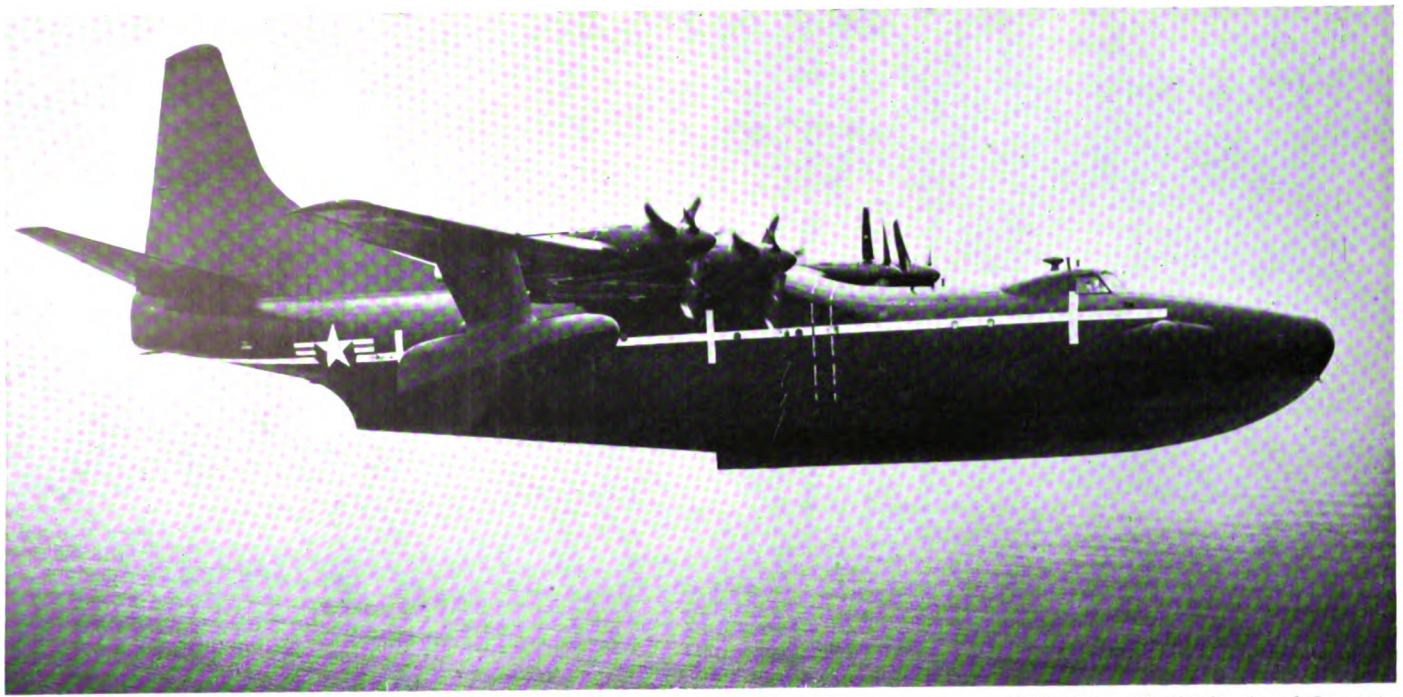

[Photo: Consolidated Vultee Aircraft Corporation

THE MOST MODERN FLYING BOAT

The Convair P5Y-1 is the very latest type of flying boat, built by the Consolidated Vultee Aircraft Corporation of San Diego, California. It is a long-range anti-submarine, general reconnaissance and rescue boat, powered by four 5,500-h.p. Allison T-40 propeller turbines, each of which consists of two T-38 units paired and geared to drive a set of contra-props. Wing span is 146 ft., loaded weight about 138,000 lb. and maximum speed nearly 400 m.p.h. It has a hull of high length/beam ratio and is about the most advanced big flying boat in the world. It is, in fact, pretty well the ideal type of home-based anti-submarine aircraft

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SEEKING SUBMARINES—AND ECONOMY

By Squadron Leader B. W. Parsons, A.F.C.

INTRODUCTION

THE twin facts of world geography and weapon development dictate that Allied forces must retain control of the air and the sea in any future war. Until this is done, Allied land forces can only achieve "local" successes and final victory will be impossible. The situation is aggravated by the strategic position of the (probable) enemy. Generally speaking, Russia and her satellites have the advantage of being on one land mass, while the western peoples are scattered around the oceans of the world. The Russian sponsored Communist threat is two-fold and seeks to establish world Communism by forcing economic collapse and/or inflicting military defeat upon those nations which live according to western democratic principles.

The under-developed countries, wherein lie a large quantity of the world's strategic materials, are economically incapable of providing adequate defence forces. As one result of the recent war, many economically advanced countries (including Great Britain) could not, on their own, maintain such forces. This has resulted in financial and military grouping, customs unions, Marshall Aid and similar devices. Even so, being strong wherever one may be threatened raises the cost of living in all countries outside the Iron Curtain, with a consequent reduction in the standard of life in these countries. The resulting discontent among the lower paid groups is easily fomented by the Kremlin propaganda organization. Hence the epidemic of agitation, sabotage and strikes which has to be stopped by economic, police or military action. The ultimate effect is to increase costs as well as to promote bitterness between various sections of the community. It becomes obvious that it is essential to provide forces capable of defending those countries which favour the western mode of life, and it is equally essential to provide such forces as *cheaply* as possible. The purpose of this article is to consider methods of reconciling efficiency and economy in relation to future anti-submarine warfare.

THE SUBMARINE MENACE

Today the submarine is the only weapon that can seriously dispute Allied control of the seas. It is indeed a dangerous weapon when one considers how Allied raw material and food is divorced from industrial capacity. In two world wars the submarine nearly brought defeat—and in neither case did the enemy possess so many or such advanced types of submarine as those at present under the direction of the Kremlin. These submarines can operate over long distances unsupported and unseen. Developments in motive power, hull design, and ancillary equipment will improve this characteristic. Allied sea lines of communication can be defended against this threat in roughly two ways. The first method is to maintain large sea and air forces throughout the world. These must be of sufficient strength and at a state of readiness which will enable them to defeat a surprise attack wherever it may be launched. The second method of countering the enemy submarine is to keep a small, efficient and fully mobile anti-submarine force with a "global" base system.

The first method is an ideal, and cannot be achieved during peace-time because of the prohibitive cost in men and materials. During war it represents a considerable attrition of our total war effort. Any defence system must take

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into account the modern practice of unprovoked aggression without warning or formal declaration of war. Consideration of the large area in which enemy submarine attacks might be expected reveals the economic difficulty of guarding against surprise by means of world-wide "standing" forces.

It seems wise that the second method of defeating the submarine menace should be adopted. Military success will depend upon the strategic mobility and effectiveness of the anti-submarine weapon, and upon the availability of sufficient bases from which to operate it. These bases must be capable of expansion to provide all the anti-submarine effort needed to defeat a major attack. Economic success will depend upon how cheaply the large number of bases can be provided.

THE MOBILE ANTI-SUBMARINE FORCE

Experience has shown that the most effective submarine killer at the present time is the fast and manœuvrable surface craft. Unfortunately, such vessels do not possess a very great range and, compared with aircraft, they lack strategic mobility. Aircraft lend themselves to mobility and with the development of submerged submarine detection devices and homing torpedoes should again be capable of a high percentage of kills.

THE AIRCRAFT CARRIER

The aircraft carrier is unsuitable in the anti-submarine role from both military and economic aspects. It is not mobile—a long-range aircraft could be investigating an attack two thousand miles from its base in less than twelve hours. The aircraft carrier would require three to four days to get to the area—by this time the more efficient surface craft could be deployed and there would be little advantage in using aircraft. The carrier is vulnerable to air and surface attack and needs the protection of a surface anti-submarine screen. It may even need the protection of a cruiser or a battleship if enemy heavy gun units exist in the area. The provision of so much naval force, merely to operate anti-submarine aircraft, is not economical. The aircraft carrier needs a highly skilled crew to operate the ship—quite apart from the aircraft. It is a pertinent thought that the work of hundreds of skilled men was necessary for its construction. From the twin aspects of anti-submarne efficiency and economy the workmen would have been better employed building fast frigates and destroyers, and the sailors would be better employed using these vessels to hunt the enemy submarine. The carrier has a large hull and is tied to elaborate docking facilities: there are comparatively few suitable graving docks in the world, and floating docks are vulnerable and difficult to tow. During the Second World War one floating dock was in tow for a year! A damaged dock and a damaged carrier could force the withdrawal of all the *perfectly serviceable* anti-submarine aircraft from a particular area. The size of the flight deck restricts the size and anti-submarine efficiency of the aircraft used. The air effort from a carrier cannot be long sustained at a high level because the ship must withdraw for fuel, ammunition, spares, aircrew reinforcements, etc. There are other disadvantages, but enough has been written to show that the carrier fails to satisfy the need for strategic mobility, military effectiveness, *and economy*, in the anti-submarine role.

THE AIR/SEA HUNTING GROUP

At the present time the best method of *economically* providing the anti-submarine force is to combine ships and long-range aircraft into hunting groups. The aircraft could be used for long-range reconnaissance and initial submarine attacks, backed up by fast, light, surface forces situated in suitable

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base areas. The economy obtained from such a system depends upon the efficiency of the ships and aircraft as submarine killers, plus the cost of naval and air bases. The more efficient the aircraft, the smaller the number of ships required in a group, and the greater the distances possible between the main bases provided for surface craft.

THE TYPE OF AIRCRAFT REQUIRED

Aircraft filling the role outlined above will have to cover long distances and remain airborne for long periods. The difficulty of finding and destroying submerged submarines will involve the carriage and use of much special equipment. This, and the strain of searching for such an elusive enemy will require a large crew, and, consequently, a large aircraft.

LAND-BASED AIRCRAFT

It is an unfortunate fact that big aircraft require big well-built airfields. Building and maintaining such airfields to cover every part of the world where enemy submarine attacks could develop is not an economical solution. It would be necessary to keep them all fully stocked and serviceable, in spite of the fact that only one or two might be used against the enemy. It is reasonable to assume that the enemy commander would be sufficiently informed of our "area of search" and "area of intensive patrol" from any particular base. He could seriously interfere with (or even prevent) our patrols, by repeated raids, or by the dropping of delayed action bombs on a particular base. In some parts of the world the fifth column might suffice to keep our aircraft grounded when the enemy wished to move undetected. Enemy parachute troops could be used to keep certain airfields out of action long enough to allow the destruction of an allied convoy or other important operation by enemy submarine forces. The task of the enemy is made simpler when bases of a known quantity and location, mostly all set up during peace-time, are used against him. It would appear that, in addition, being cheap to provide and maintain all over the world, our Hunting Group air bases should be unknown and invisible to the enemy!

It is difficult to site main base airfields near to the naval forces with whom the aircraft will work. With advanced naval bases and large land-based aircraft it is nearly always impossible. Yet it is important that Navy and Air Force live together, in order that they will more efficiently fight together in the Hunting Group Organization. Another difficulty is that the separation of sea and air bases involves extra men, machines, and equipment, to maintain the necessary liaison. Distance between the sea and air base also increases the risk of poor security and lessens the speed at which an operation can be mounted. However, the main objections to the use of land-based aircraft in the Hunting Group are the same as those brought against the aircraft carrier—lack of mobility and expense. The land-based aircraft is not strategically mobile unless thousands of tons of concrete runway follow or lie in wait for enemy submarines all over the world. To provide this on a sufficient scale would be very costly and would not eliminate the other difficulties mentioned above.

FLYING-BOAT FORCE

This type of aircraft can be based in the same harbour as the naval hunting group at main bases. Advanced bases can be set up near to the enemy patrol area with only a few hours' notice. The arrival of the force is not preceded by bulldozers and steam shovels, and even a thousand-bomber raid wouldn't leave a hole in the runway! Perimeter tracks, hardstandings, elaborate air

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traffic control sections, complicated and vulnerable blind landing aids, motor transport, etc., are not necessary at all on temporary bases, and are not initially required at the more permanent ones. Crews can live on their aircraft or in tents on shore. Fuel, spares and ammunition can be flown in by flying-boat squadron supply aircraft until enemy activity shows that it is necessary to establish a force in the area. If this becomes desirable then a light, high-speed supply ship can move in and act as depot ship. No escort, large docks, big specialist crew, etc., necessary. If the enemy attack be shifted to another area the whole force can follow without leaving an expensively prepared airfield derelict—or spending time or money on a new one in another area. The function of supply ship could often be carried out by the naval or merchant vessels in the group or convoy that the aircraft is supporting—it is so much simpler to organize the ships and aircraft as one force when both float!

Most aircraft servicing would be done by the flying-boat crew as was the case at the beginning of the late war. This would call for the readoption of the principle of training skilled tradesmen as aircrew for this force. The crews should be backed up by experienced servicing commandos, ready to go anywhere in the world by sea or air, and equipped with portable servicing equipment.

Economy of force is achieved because of the strategic mobility of the flying-boat. The force can be where it is needed *when* it is needed, and it does not need to be maintained in an area because an attack *might* develop there. The commander of a flying-boat force can switch his area of search round the rivers and oceans of the world. He can, on occasions, adopt moving patrols that do not use the same bases for more than two or three consecutive days. In 95 per cent. of cases his runways are right into wind and twice as long as is necessary. (Even allowing for overloaded operational aircraft.) No time or effort has to be expended to achieve this—or to fill in bomb and shell craters! Biological or atomic warfare will be less effective against a waterborne force of the type described, since it will be possible to quickly move it to a safer area. The enemy may find it difficult to eliminate all the alternative water bases!

As the majority of main flying-boat bases will also be naval harbours, a considerable saving in defensive force must result. (This will also apply to a number of advanced bases.) Anti-aircraft guns, searchlights, predictors, men—even fighter aircraft—will be released for other tasks.

There are many other economies resulting from the use of flying boats in the Hunting Group role. At some main bases and at all advanced bases it is possible to off-load stores direct from supply ship to aircraft base or to depot ship. This cuts out the dock facilities, motor transport, and railway services which are necessary to operate the normal land aerodrome, and results in a large saving of time and money.

No special A.S.R. force is necessary to cover the operation of flying boats, because this type of aircraft is itself particularly suited to the task. The rescue of the whole crew of s.s. *Kensington Court* by Sunderland aircraft during the Second World War serves to emphasize this point.

ALL-WEATHER OPERATIONS

The flying-boat force could not achieve complete all-weather operation with present equipment, but the inherent advantage of this type of aircraft in bad weather may not be generally realized. It is significant that with a two-hundred feet cloud base (above mean sea-level) and one mile visibility it would be virtually impossible to land a land-based aircraft upon its specially prepared airfield without V.H.F., G.C.A., I.L.S., or a similar aid. Under exactly these

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weather conditions a flying boat could land in a harbour or river mouth with no aids, and indeed with no radio or radar contact with the ground *at all*. It seems hardly necessary to stress the advantage in economy and mobility thus obtained. The cost (in time, equipment and man power) of a G.C.A. team is obvious. The need to transport the team and equipment to an advanced airfield before the base can be used regularly—even in weather better than that described—is a serious strategic and economic limitation.

With certain developments it should be possible for a flying boat to use its anti-submarine radar to taxi, take-off and alight in fog. It is already possible to alight in fog under certain conditions without any help from the ground. This is largely due to the technique used when alighting a flying boat in bad visibility. The aircraft is set up in the alighting attitude by reference to the flying instruments. It is then allowed to descend at a fixed rate until it strikes the water. No check or visual break-off is necessary. (A radio altimeter is accurate to a few feet over water so that no check with ground-level pressure is necessary.)

CREW COMFORT

The deep hull of the flying boat—necessary to keep the propellers clear of spray—makes it easy to carry all the special equipment required in modern anti-submarine aircraft. It is a relatively simple matter to provide the crew with comfortable quarters for living aboard during duty at advanced bases. In addition, the "psychological" comfort of operating an aircraft that can "get in" to dozens of unprepared bases (without aids) in emergency, has to be experienced to be fully realized. There is the additional fact—important to crews which operate largely over the water—that a ditching will usually be merely an emergency landing.

SUMMARY

(*a*) The democratic nations face the persistent threat of Communist military aggression. Economic "aggression" has been in progress for many years and has been noticeably intensified since the end of the Second World War.

(*b*) The cost of large-scale military preparedness throws a considerable strain on the national economy. Every effort must be made to reduce such expense.

(*c*) At the present time the submarine is a difficult and expensive weapon to counter. Most of the non-communist countries would ultimately be defeated if their sea lines of communication were severed.

(*d*) The Kremlin controls the largest submarine fleet that the world has ever known.

(*e*) The flying boat is the best (air) anti-submarine weapon yet devised. It is both effective and economical. To date it has only been limited by equipment, training, and unimaginative strategical and tactical planning.

CONCLUSION

A vigorous flying-boat development programme must be put in hand at once. Tactics, strategy, training, equipment, servicing and supply—all must be *completely* revised if the force is to operate at maximum efficiency. Full exploitation of its military capabilities will only be possible after it is realized that a flying boat is neither a ship or an aeroplane. It is a *Flying Boat*, and as such is potentially the most mobile form of weapon that the world has yet seen.

A famous C.A.S. has stated: "We must break the chains that bind us to concrete and this country." The flying boat has never been chained to concrete or this country. Its use has been restricted by what is perhaps an even greater handicap. It was chained to an Old Idea. We *can* free it—and we must!

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[Air Ministry photo

UNITY OF COMMAND

The turn of the tide in the last war came at a point when . . . the Western Allies were able to employ their forces as a unified combination of air, sea and ground weapons under one supreme commander

Back row, left to right: *Lieutenant-General Bradley, Admiral Ramsay, Air Chief Marshal Sir Trafford Leigh Mallory, Lieutenant-General Bedell Smith*

Front row, left to right: *Air Chief Marshal*

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THE CASE FOR A ROYAL UNITED SERVICE

By Wing Commander T. D. Calnan

Introduction

NEVER before in recorded history has the prospect of war held for mankind more terror or such a threat of unlimited devastation and destruction. Never before has so great a part of the world's population more ardently desired peace. Desperate efforts are being made by statesmen and nations to preserve and safeguard the peace which the world still enjoys. Unfortunately the outlook is far from encouraging. The world's confidence and faith in the great United Nations Organization, which it established to secure peace, is waning and many nations are again looking to national armed forces to safeguard their peace and security.

The quality of peace which still prevails is poor and deteriorating. Great undeclared diplomatic and economic wars are in fact already in progress. Undeclared shooting wars are raging in various parts of the globe. Lloyd's of London, who are the greatest and most experienced underwriters in the world, quote very short odds against a major war in the next five years.

From a strictly military viewpoint it is most unwise to attempt to put a limit on the probable duration of peace. In Britain in 1924, political inspiration, amounting almost to genius, produced the "Ten Year Rule," by means of which the Chiefs of Staff were told to base their plans on the assumption that there would be no major war for ten years. Incredible to relate, this rule was never amended; the safety period was not reduced successively each year but remained permanently at ten years until the state of world affairs made it imperative to abrogate it. The effect on our armed forces was most serious.

Whatever the possibilities of continuing peace or the dangers of war today, this period of peace should be regarded as a breathing space in which to review the effectiveness, composition and organization of the armed forces and an opportunity to study and apply the many and vital lessons of the last war. It would be foolhardy to assume that this task is not urgent.

This article examines the defects and limitations of Britain's present organization of her armed forces. The effectiveness of the organization in peace and war, as well as the employment and efficiency of the forces themselves, is critically analysed. In consequence of this analysis a reorganization of Britain's armed forces is proposed which will result in a thoroughly efficient national organization for the control and co-ordination of the armed forces, so that in war they may be employed effectively, and in peace they may be administered and trained with efficiency and economy.

THE PRE-WAR ORGANIZATION OF BRITAIN'S FORCES

The Emergence of the Third Service

The fact that Britain today has three separate armed services is due in part to the foresight of our military leaders and in part due to tradition. Until this century the nation's forces were composed of only two elements, a land force and a sea force. Through centuries each of these forces had acted independently of the other and developed entirely separate functions, strategies and traditions. Each force operated in a different element and each was entirely competent to carry out its function with the minimum assistance from the other. This juxta-

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position of the two services was entirely suited to the nature of wars in those days and it was not until the emergence of air power as a weapon that any adjustment or modification became necessary.

When the Army and Navy eventually became aware of air power, they each in turn claimed it as an auxiliary. It might well have been developed in this fashion; indeed, in the U.S.A., that was to be its fate for a period. But in Britain its potential value as a weapon of war in its own right was recognized, and it was therefore necessary to grant it the status of a separate service in order to promote it from its subsidiary position. This step was logical and in accordance with our tradition of a separate Army and Navy. It was to be assumed that the war in the air would be as separate from the war in the two other elements as the sea war had been from the land war in the past.

The Early Evaluation of Air Power

The full impact of air power on the established conceptions and strategies of war was not realized until it was finally emphasized by harsh experience during the last war. In the period between the two great world wars the effect of air power had remained little more than a theory. The last war showed not only that the terrorists were correct, but that they had underestimated the power of their protégé.

Before the outbreak of the last war the real threat of air power and its effect on the traditional functions of an army or navy was only partially realized. The Navy, for instance, while it flatly denied that the aeroplane could sink a battleship, developed an air arm. The Army, which was still expecting to fight trench warfare on the Continent, also required tactical co-operation and reconnaissance. In fact the older services had evaluated air power only as an auxiliary weapon.

THE ORGANIZATION TESTED IN WAR

At the outbreak of war Britain had three separate services whose functions were to operate independently within the over-all national plan. Each service was designed to be self-sufficient and certain steps had been taken to counteract the effect of air power on the Army and Navy. The Navy, within the limits of its own restricted evaluation of air power, an evaluation made by naval strategists and in relation only to naval strategy, had its own air arm. The Army, making its evaluation of air power in relation to its own functions, required and received from the Air Force certain auxiliary assistance. The Air Force itself had been designed in accordance with the air strategist's evaluation of air power. The three services were organized to operate independently. If co-operation between them was necessary, the Services were not only largely unpractised, but the conception of the extent to which co-operation would be necessary fell very far short of subsequent experience.

The Years of Disaster

The early course of the war showed with disastrous emphasis how incomplete was our evaluation of air power, especially in regard to land and sea operations. The Navy found that their battleships could no longer fight private battles on the high seas with the enemy fleet. The Army discovered that there was more in war than standing in trenches. All the traditional conceptions of war were changed because of the interference of air power. The conception of true air power as exercised by a separate air force proved to be accurate enough, but the Air Force itself was inadequate and undeveloped. Many bitter lessons were learnt in the Skagerrak, in Norway, in Greece and in Crete, and in the final analysis it became clear that neither the Army nor the Navy could carry out

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their traditional roles on their traditional battlefields against enemy air power. Both the Army and the Navy discovered that air supremacy was a preliminary essential to their successful operation in their own element.

An analysis of Britain's military disasters in 1940, 1941 and 1942 makes it clear that a basic cause of our successive defeats was the failure to supply the Army and the Navy with adequate air support. The reasons for this can be simply stated. Britain's air power was inadequate in size and equipment, and the cause of that inadequacy was incomplete, mistaken and divided planning. Air support for the Navy had been planned as an auxiliary weapon. Exactly the same was true of the Army. The conceptions of air power in the Army and Navy were proved erroneous and inadequate, with the result that neither service had sufficient air support from its own or allocated sources. The Air Force itself was unable to assist materially for two complementary reasons. In the first place it was not big enough and, secondly, it had not been designed for that purpose.

The role of the Air Force (you may refer to the R.A.F. War Manual) was "to attack selected targets the effective bombardment of which is best calculated at the time to undermine the powers of resistance of the enemy nation," and, "to provide defence against air attack." Its responsibilities in relation to its sister services were to a certain extent provided for by separate or allocated air forces based on their own evaluation of their needs. Over and above this the Air Force had a responsibility to co-operate with the other services. The type of co-operation which was envisaged at the beginning of the war was limited to the employment of aircraft in an ancillary role, as can be seen from the appropriate sections of the R.A.F. War Manual. The necessity to attain complete air superiority in any theatre had been foreseen, but only in relation to the strategical role of the Air Force itself. No provision had been made to fight and win an air battle as a preliminary to a sea or land battle. It can therefore be fairly stated that air power in the early years of the war was inadequate certainly because of insufficiency in numbers, but more basically, because of divided planning as a result of different opinions of its value, divided resources, divided command and divided responsibility.

The Years of Success

The turn of the tide in the last war came at the point when Britain was able to employ her forces as a unified combination of air, sea and ground weapons. Military victories began to follow when the increasing strength of our three services, and of the Air Force in particular, enabled the appropriate equilibrium between them to be attained. Few major operations during the last three years of the war did not combine land, sea and air forces. The war in the Pacific, the invasions of North Africa, of Sicily, of Italy and of Europe are all examples of using a unified force of land, sea and air weapons in balanced proportions. It is important that this chief characteristic of modern war is recognized and remembered when considering the organization of armed forces in time of peace.

The Lessons Learned and Applied

One of the most vital lessons of the war was that Britain's three services were no longer separate entities responsible for the war in their own element. To achieve success they had to become complementary parts of a co-ordinated whole. Out of the necessity for gaining air supremacy as a preliminary to any land, sea or air operation, and out of the realization that our services were dependent on each other for successful operation, was born the unified and co-

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ordinated employment of our three services under a single commander. The war not only proved that the three services could be successfully co-ordinated to the extent of working in unification under a single commander, but also that such an organization was the only practical one for victory.

LIMITATIONS OF THE PRESENT ORGANIZATION OF BRITAIN'S FORCES

An analysis of the campaigns of the last war, however thorough and instructive, has only an academic value if the lessons learned from that analysis are not put into practice. The succeeding paragraphs attempt to discover whether there is reflected in the present organization and composition of Britain's forces any of the new wisdom of war.

Britain has reverted to her traditional organization of three separate services. Each service has a separate role, separate planning and research, and separate systems of logistics and training. The last war demonstrated unequivocally that none of the services is a separate entity which can fight an independent war in its own element. The shape of modern war seems to demand that armed forces must be so organized that they can be employed in any theatre in the world as a single co-ordinated force, comprising all weapons, under the control of a supreme commander. Britain's armed forces cannot achieve this by organization, and it is Britain's plan to achieve the necessary degree of co-ordination and unity by means of inter-service co-operation.

Co-operation is the factor which is popularly supposed to have contributed most to the successful employment of the allied forces in the latter half of the last war. It is my contention that this is a part answer and an incomplete analysis. Co-operation between the three arms was undoubtedly an important factor in our success, but it is by no means certain that co-operation alone was the factor which assured progressive successes and final victory. Co-operation between three autonomous services demands agreement, or, failing that, compromise. Agreement between autonomous services with independent roles is remarkably difficult to achieve, and compromise seldom provides the true solution. Full co-operation demands great sacrifices on the part of each service in the abandonment of many established ideals, principles, traditions and methods. In the stress and necessity of war such sacrifices are, and were, more easily and willingly made. It is, however, dangerous to rely solely on mutual trust and faith between the services and an understanding of one another's problems, to attain co-operation. Nor was this so in the last war.

In the last war complete inter-service co-operation was not attained until the services lost their autonomy. It was attained when three independent commanders of land, sea and air forces gave way to a single supreme commander. Then co-operation could be assured for two reasons. In the first place agreement was easier to achieve because there was one common aim and one common plan, and in the second place co-operation did not depend finally on agreement because the supreme commander was able, if necessary, to direct what co-operation was required and would take place.

The most important factor in the successful employment of our forces in the last war was, therefore, not co-operation but unity of command. Without unity of command, co-operation is a matter of personalities, persuasion, argument and compromise. It is, in fact, uncertain. It is my contention that the extent of co-operation achieved during the last war could not have been attained without unity of command.

There is no unity of command in Britain's armed forces in peace. Britain is

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attempting to counteract this defect by superimposing on the organization of three autonomous services the theory and practice of co-operation. The means by which this is being attempted are very broadly as follows:

(*a*) A wide diffusion of co-operation propaganda, emphasizing the importance of close inter-service relations and the necessity of each service understanding the principles and functions of its sister services.

(*b*) A determined effort to educate as many officers as possible (of the rank of Lieutenant-Colonel and above) from all services, in the operational relationship between the three arms and their functions in co-ordination. However, the schools established for such education are few.

(*c*) The establishment of a small number of schools where training in the various forms of combined operations is carried out.

(*d*) A system of joint committees and conferences at high level for the purpose of co-ordinating planning.

The above list is not impressive and probably not complete. Nevertheless it is pathetically inadequate if its purpose is to prepare the armed forces for the degree of effective co-operation which is imperative in modern warfare. Such an attempt to superimpose a framework of co-operation on the existing organization will result in Britain entering the next war in a state as unprepared as that in which she found herself in 1939.

Co-operation is not a matter of education and high-level conferences. Primarily it is a matter of operation. In war the spheres of dependence between each of the services soon make themselves obvious, consequently the range of co-operation which is necessary can easily be defined. In peace the opportunities and necessity for co-operation between separate services are few and consequently there arise two serious dangers. First, co-operation must be planned without the benefit of a proving ground, which is exercise and practice. Secondly, it is likely to be planned to conform to the standards set by the last war. The standards set by past wars, if rigidly accepted and not reviewed in the light of the progress and development of weapons and methods of war, are notoriously the most dangerous basis for planning.

The Interdependence of the Services

The last war showed clearly that all of the three services were interdependent. In particular, the Army and Navy were dependent on air power. They could no longer consider themselves self-sufficient in the most important sphere of all—in actual battle. During the last war this unresolved dependence was initially a major cause of a series of military disasters, and finally the reason for the unification of the three services in operation and command. The last war demonstrated therefore that unresolved dependence is a disastrous characteristic in armed forces which operate independently, but that in unified forces dependence is an acceptable and natural factor.

The organization of Britain's armed forces today is one of separation rather than unification, and is furthermore an organization which was designed a long time ago for independent services. But Britain's services today are all dependent. The force and pattern of the present organization is tending to remove the dangers of dependence in a manner which is the antithesis of the solution found in war. The dangers of dependence vanish when the three arms can be unified in the correct equilibrium. When, however, the organization which frames those arms is such as to deny the solution of unification, the only remedy is to attempt to make each service entirely independent by giving it the control of the weapons it lacks.

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The Navy is rebuilding its own air arm, basing its requirements on the experiences of the last war. The Army has formulated its exact needs for a tactical air force, again based on the last war, and will require the Air Force to allocate these forces to that particular and specialized work. Even the Air Force has formed an R.A.F. Regiment to perform the duties of soldiers.

This tendency is dangerous and the danger increases as it progresses. In so far as it concerns air power, it is the negation of the principle of concentration, and it seriously undermines the essential unity of command of air power. It is in fact a repetition of the penny packet parable. There are other inherent dangers. These are mainly threats to the true and full exploitation of air power, but as this would appear to be an era in which the value of the aircraft in war increases as fast as the value of the battleship and the foot-soldier decreases, they are of considerable importance.

The Navy has its particular role to perform in war and its main weapon is the warship. The Navy's air arm will again be planned as an auxiliary to naval power and strategy and will be based on the naval evaluation of the employment of air power in the last war. The planning of the Navy's air arm will be in the hands of naval strategists and will fall within the framework of naval strategy as a whole. Research and development in the Air Force proper, new strategy, new tactics, new evaluations of air power will not necessarily find acceptance or recognition with the Admiralty. Indeed, the development of the theory of the employment and effect of air power is more likely to be opposed to, or at least out of harmony with, the theory of sea power. There is a real danger that the naval air arm may be developed as an auxiliary to naval strategy, in ignorance of, or in spite of, developments in the employment of air power as a major weapon. There are, in fact, present in the preservation of an entirely independent naval air arm, conditions and possibilities which might cause a pessimist to prophesy that between now and the next war the Navy will prepare to fight its air/sea battles as they were fought in the last war. Unfortunately the development of the scope and effectiveness of air power will not wait on the Navy, and the next war may find the Navy as ill-prepared and ill-equipped as it was at the beginning of the last war.

It is the Air Force which supplies the Army with the air support it demands. This might appear to be a safeguard to the Army, in that the tactics of the air arm allotted to it will at least be up to date. It might also appear to be a safeguard to the Air Force in that it preserves its unity of command in relation to the tactical air force. Neither of these safeguards is as sure as it may appear at first sight. Although the Army has acknowledged the value of unity of command in air power and is unlikely to require the control of its own air arm, it is not the control of the air arm nor the responsibility for its provision which matters, it is the Army's own evaluation of air power.

The Army has made its evaluation of air power and formulated its requirements very exactly. These are based on the successful battles of the last war, when air supremacy was so well established that the battle for it had been forgotten. The air arm allotted to the Army will be employed as an auxiliary to the land battle. The Army is not concerned with the necessary preliminary of winning the air battle. This is not unreasonable, for the air battle is entirely the responsibility of the Air Force.

In order to win the battle for air supremacy, all the available forces of air power must be concentrated on the task. An allocation to the Army of specialized squadrons for a tactical air force is perhaps an extravagance which a small air force cannot afford. If the power and influence of the Army should

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obtain the allocation of a complete tactical air force in peace time, the winning of air superiority, so that the Army itself can operate, may be seriously delayed.

The Army's knowledge and evaluation of air power may atrophy at the level attained at the end of the last war. Modern warfare is in a state of rapid evolution: the tactical air force of the next war may bear no resemblance in composition or function to the tactical air force of the last war. There is, however, little opportunity for the Army to enlarge its knowledge of air power and keep it up to date. Inter-service co-operation on the scale planned, and occasional combined exercises, are hardly enough to influence a thorough and regular revision of the Army's air requirements. There is therefore a danger that the Army may have to fight the next war with air support as inadequate as were the army co-operation squadrons at the beginning of the last war.

The Dangers Inherent in the Present Organization

The main dangers inherent in the present organization of three separate services are summarized below:

(*a*) It is a system which in peace time separates by a traditional organization services which in war must be as close to unity as possible.

(*b*) That each service will try to lessen its dependence by increasing and developing its own independence, in particular by building up an auxiliary air arm.

(*c*) That the division of air power into small parts, which is a negation of concentration, will seriously decrease the effectiveness of air power as a whole.

(*d*) That the continuing education of the Army and Navy in the theory and practice of air power will make no further progress now that the cessation of war prevents them from learning by experience.

(*e*) That co-operation between the services as a remedy to dependence, will be based upon different conceptions and evaluations of air power which will not mature as fast as air power makes progress.

(*f*) That in a system of separate services a wrong evaluation of air power will not become evident until attempted co-operation in war proves it to be so.

THE ESTABLISHMENT OF A UNITED NATIONAL FORCE

There are two choices open to a nation whose organization of her armed forces in peace does not promise to be effective in war. The first is to take no action and rely on improvization when it becomes necessary. The second is to commence an immediate reorganization. The first alternative is easier, and in Britain's case there is many a precedent for it. Britain's capacity for "muddling through" is famous. The second alternative, however, is the only real one to be considered, and if it is to be attempted it must be treated urgently.

The only practical remedy for the defects and disadvantages of the existing organization of Britain's armed forces is so to reorganize that each separate service loses its identity and merges into a single unified national force under a single command. Each service must lose not only its individuality, but also its traditional role in war. The principle that each service had a separate function in war is obsolete. It assumes that the service to which that function is allocated possesses the weapons which will most effectively perform that function. In modern war this is by no means a safe or logical assumption. It is the Navy's major role, for instance, to protect our sea communications. It may well be that sea power in the form of warships is no longer the most efficient weapon for that

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very vital task. It is quite possible that air forces may in the future be able to provide the necessary protection of our sea communications more effectively and more economically. Similarly, the role of the Air Force is to reduce the enemy by bombardment. It is very possible that in this field the aircraft will eventually give way to the guided missile.

The allocation of definite roles to each particular arm or weapon is the antithesis of flexibility and makes for an unwanted rigidity in organization and operation. Britain's united service must have one single, if complex, role. It must be composed of the combination of weapons which will most effectively perform that role.

Britain's united service must be so organized that it can employ in any theatre in the world a balanced force of land, sea and air weapons under a single commander. This requires that Britain's forces, instead of being organized into armies, fleets and air forces, must be organized in the form of the task forces employed in the last war. I will restate what I consider to be one of the most vital lessons to be learned and applied from the successful campaigns of the last war. It was proved then, not only that the three fighting services could be, in battle, successfully amalgamated to the extent of working in unification under a single commander, but also that such an organization was the only practical one for victory. In war there was no time or opportunity to organize the common system of administration and logistics, or the co-ordinated systems of training, which such employment of our fighting services logically demanded. But in peace such reorganization can be and must be faced. The problems presented by such a reorganization are immense, and they are by no means insoluble.

CONCLUSION

I do not intend to argue in detail the advantages of a united service. Its main recommendation is that it embodies the greatest principle which emerged from the last war—unification. To ignore this vital lesson of the last war is foolhardy and illogical. There is little or no logical military justification for the retention of an organization of three separate services. The most steadfast supporter of the present system is tradition. Tradition in Britain is a powerful force which invariably and bitterly resists change. This force must be overcome.

The formation of a united service will remedy the defects, and neutralize the dangers, in the present system. It will remove at one stroke the illogicality of three different planning staffs for the armed forces; it will secure co-ordination by organization in peace as well as in war; it would make co-operation between the arms of the united service a natural and everyday function. It would remove the danger of disunity in the command and employment of air power and should ensure the full and correct evaluation of all existing and developing weapons of war. It would remove duplication, parallelism and conflict in the administration, supply and operation of the armed forces, thereby increasing efficiency and effecting a great economy in both peace and war. It would provide a national force which in peace can be trained to operate as it must in war and whose readiness for war would therefore be greater.

The most difficult decision which must be made is to determine the equilibrium between the three major component arms in a united service. This problem cannot be solved by an army, a navy or an air force officer. The expert opinions of each service will be partisan and biased and the true and proper solution will only be arrived at by means of an open-minded and judicial consideration of all their arguments.

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THE STRATEGIC BOMBER FORCE OF THE NEAR FUTURE

By Flight Lieutenant E. Jackson

In the past the term "strategic" has been applied to types of aircraft and of air forces as well as to types of targets and operations. In the use of the term in this article, it is the function of long-range bombardment that is meant.

THE AIM OF THE OFFENSIVE

THE aim of the strategic bomber offensive can be regarded as a twofold one, primarily the long-range bombardment of the enemy's military, industrial and economic potential, and, secondly, the support of our own, or allied, surface forces, both on land and sea.

In the event, however, the best form of support is long-range bombardment, for its effects are felt in all theatres of war where the military forces of the enemy are to be found. The attacks upon the great armament centre of Krupp's produced effects which were felt in all arms of the German military machine. The destruction of targets associated with the construction of U-boats gave valuable support to our maritime anti-submarine forces. In both these examples, and many more exist, the roles of long-range bombardment and support were effectively combined.

Not so when we consider the employment of our heavy bombers against German rail movement in Northern France in preparation for the invasion of Europe, nor in the diversion of such aircraft and aircrews to anti-submarine duties in the Atlantic. That both these diversions were necessary is not disputed, but that they were not the bomber offensive proper, nor helped in its attainment, cannot be denied.

The opening paragraph of the Casablanca Directive from the Chiefs of Staffs to the British and American Bomber Commands in January, 1943, best sums up the primary aim of a strategic bomber offensive: "Your primary aim will be the progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened." This was just about what happened in the next two and a half years, and the peak of the bomber offensive was reached during the latter part of 1944. Here it is pertinent to ask whether, in the event of another war, there will be time to mount a progressive bomber offensive. Such a question can only be answered by the situation prevailing at the time.

It is likely that the time required will not be as great as that taken from the issue of the Casablanca Directive to the reaching of the offensive's peak in 1944, for during that time not only were the necessary forces being marshalled, but the tactics, techniques anl organization essential to their successful employment were also being evolved. From the problems encountered and solved during that development period we have acquired those basic principles which will govern, to a great extent, the employment of bomber forces for many years to come, certainly for as long as piloted aircraft carry out the role of long-range bombardment.

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FACTORS ESSENTIAL TO THE FUNCTION OF THE FORCE

There are innumerable factors, large and small, that are essential to the proper function of the force and consequently the attainment of the aim. They are, however, somewhat reduced in number when consideration is given to the primary aim only. It will be realized that some factors will be common to both the primary and the secondary aims and cannot be separated. The three that follow are considered the most important ones, having the greatest effect upon the successful fulfillment of the long-range bombardment role.

Economy of Force

It is common knowledge to all that Europe—and that includes us—is undergoing an immense struggle to adjust its economic life and make itself independent of assistance from the Western Hemisphere. Our maximum available efforts are being directed into productive spheres and we are unable to spend more on our military forces than is absolutely necessary.

In peace time no democracy is prepared to spend a large part of its wealth upon preparations for a hypothetical war. But although, in this respect, we cannot escape a negative economy, it is the positive one that is of paramount importance. Economy of Force through quality, mobility, flexibility and target selection, and in many more like ways, is what we must concern ourselves with.

It is certain that we, nor our allies, will never set forth on the path of an aggressive international policy, and so any war we may become involved in will be the result of aggression against us, or one of a coalition of powers to which we may belong. Formal declarations of war, before the start of hostilities, are now as dead as the Dodo, and the first intimation of such an occurrence will be the movement of military forces against us. The element of surprise will be to the aggressor's advantage and in the beginning our armed forces will, in the strategic sense, be on the defensive, although an offensive policy would no doubt be pursued wherever and whenever possible.

Long-range bombardment by a bomber force has the unique characteristic of combining offence with defence, yet remaining essentially offensive. That such a force will be small at the commencement of hostilities there is no doubt, and that the demands placed upon it will be many and varied and far beyond its ability to comply with, is equally apparent. Moreover, if complied with, these demands would reduce our force, as a power to be reckoned with, to impotence. We must not do as we did in the beginning of the last war, spread our effort over many target systems with the result that none were really effected. With the small force that will be available it will be suicide. We must attack those targets which will have the greatest effect upon the enemy's ability to wage war. As the C.A.S. has said in a recent article: "... if we try to be strong everywhere, we shall be strong enough nowhere. . . ."

Good Intelligence

The importance of the correct analysis of the various target systems, and the selection of the appropriate ones for attack, can only be made through good intelligence of the enemy's industrial, economic, financial and military potentials. Only by this means can Air Power, in the form of the strategic bomber force, be successfully applied. In peace time the sources of such information are many and varied, and in the main come from those people whose everyday business associates them with that country. State departments, too, can acquire much useful information, as can the casual visitor or traveller in transit. But upon the outbreak of war almost insurmountable difficulties appear which

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[Air Ministry photo

A large area of Krupps arms works at Essen in full production of weapons of war, flowing in a steady stream to the active employment of the fighting forces engaged in aggression

[Air Ministry photo

Krupps works after a raid by** a strategic bomber force of the opposers of aggression. **The destruction caused has** considerably reduced the flow of arms and undermined **the offensive powers of the aggressors

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restricts the reception of such information, although new channels appear through air reconnaissance and "cloak and dagger" methods.

It is then, in time of peace, that the greatest opportunities exist for the collection of that invaluable knowledge upon which the various situations which may prevail in the opening stages of a war, can be assessed. From these will be selected those upon which our subsequent actions will be based. And it is imperative to recognize the fact that they must be the right ones; we cannot afford to be wrong, for such may well mean defeat and a subjection to a terror never before known and for an inestimable period of time.

Information concerning the more important items is not likely to come from one source, except as a matter of luck. It is more likely to be obtained from many scraps of information from different sources which, by themselves, mean nothing, but when collected together, sifted and checked, shows its importance. The nucleus of our present intelligence organization is considered capable of fulfilling those functions upon which will depend the soundness of our actions. We must not lose the first battle; if we do, the result may well be disastrous.

Security of the Base

It has already been said that by the long-range bombardment of an aggressor's industrial complex, the bomber is essentially offensive, and by being so is also a means of defence. This is achieved by forcing the enemy to divert an ever-increasing proportion of his war potential, in material, manpower and equipment, to the defence of the threatened areas, not only for active defence but also for passive. This, coupled with the additional organizational, administrative and command problems it creates, has the effect of reducing the maximum possible strength his offensive can attain.

For the bomber force to operate at its greatest strength it is necessary that the bases should be relatively free from enemy attack. It is no use despatching aircraft on a mission if, on their return, their highly complex bases are no longer capable of sustaining them for future operations. Local air superiority must be assured from the beginning, and maintained and expanded as the battle progresses. The attainment of the necessary degree of air superiority is not achieved by fighters alone, but through the combined efforts of all those elements that go to form the Air Defence forces of the nation. Here again the bomber offensive assists, in achieving air superiory, by forcing the enemy to divert an ever-increasing proportion of his fighter aircraft to the defence of the homeland.

To enable our Air Defence forces to operate effectively we must link with them an adequate early warning system closely integrated with one of control. In this sphere the advent of high speed, high altitude aircraft has presented some formidable problems in their early detection and interception before the target is attacked. An adequate period of warning can, at the present time, only be assured by establishing the necessary devices as far from our bases as possible. We must remember that there is a minimum distance that they can be so positioned, and any reduction of that space can only mean that the effectiveness of our defences will be reduced and may well be rendered incapable of functioning.

In any future continental war the United Kingdom will once again become the vast military base that it was in the last. It will be dependent too, on those very same lines of communications that were so nearly severed by the enemy's submarines. The modern submarine, capable of travelling for long periods submerged at high speeds, has swayed the balance of power in maritime warfare into its favour, and new, or improved, counter-measures must be developed

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to combat it. Our maritime forces, and that includes air elements as well as naval ones, must be adequate to the task of successfully countering an intensive submarine campaign aimed at the neutralization of the base by severing its essential communications. In the absence of new or improved counter-measures the aircraft, as a means of anti-submarine attack, will become increasingly ineffective as the technical development of the submarine proceeds.

In the last war more than half the German U-boats at sea were sunk by allied aircraft, and in this respect, the adaptation of the heavy bomber to such work was most valuable, particularly in the Battles of the Atlantic of 1942 and 1943. It is well to realize that the modern bomber will most probably be incapable of conversion to such a role.

In providing for the security of the base it can be seen that the aeroplane plays an ever dominant part. That being so, it is imperative that a proper balance between the defensive and offensive needs be struck and maintained at all times. The proportion of our available resources allotted to each role must be the correct one. For it not to be so would mean the abandoning of the principle of Economy of Force which will be so important in another war, particularly in its opening stages. In the words of the recent C.A.S., in an address to the Royal Empire Society: "In this last war the air situation was not safe until the air war had moved away from our skies and the Battle of Britain had become the Battle of Berlin. In any possible future war, more than ever would it be vital that the air battle be pushed far from our own skies." The bomber offensive can do this.

CHARACTERISTICS OF THE FORCE

To enable a strategic bomber force to operate successfully there must be present certain characteristics which will be indispensible to its operation. The ones that follow are considered the most important, although it is emphasized that they are not the only ones.

All-Weather Operation

There can be no doubt that this is of supreme importance and no bomber, or any air force, should be liable to grounding through weather conditions. All other characteristics which the force may have are subordinated to this one. Not only must the force be capable of operating in extremes of "local" weather, but also in that of climate, ranging from the tropical to the arctic. To meet these variations, aircraft design, and that of its ancillary equipment, air and ground, becomes of great importance and one into which considerable research will be necessary.

Of equal importance to design is the provision of long- and short-range homing devices and landing aids. The density of traffic that these aids will be required to handle will be high, so enabling the time factor in bringing an aircraft down from its operating height, which may well be 60,000 ft., to complete a successful landing, to the minimum that technical and physiological restrictions will permit. To achieve this the aids will need to be purely automatic and completely independent of pilot co-operation, thus enabling the ground organization to be "streamlined" by a reduction in the number of communication channels, personnel and equipment that would otherwise be required and the presence of which would reduce the handling rate of the aid being used.

No amount of mechanization, however, will remove the need for human skill in the handling of the aircraft, for the movement of the machine on the ground, and between base and target, will still be controlled by a human being carried

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within it. The time when this is no longer necessary will herald the arrival of "push button" warfare. As the cost of the modern bomber may well approach £500,000, any reduction in the wastage rate caused by human error on the part of the pilot assumes a position of no small importance. It is obvious that this can only be reduced by an improvement in the degree of human skill attained by the pilot, coupled with such technical developments as become necessary.

Ability to Penetrate

Next to All-Weather Operation this is probably the most important characteristic that a modern bomber force must acquire. Without it Air Power could not be wielded against the very vitals of the enemy. In this respect our thoughts turn to consideration of the range of aircraft, and it is here that it becomes desirable to recognize the difference between "theoretical" range and "operational" range. The first can be said to be the maximum distance that can be flown in still air with a full fuel load and at maximum all-up weight, without allowing for such factors as start-up, taxi-ing, take-off and climbing to optimum operational height, wind effect, navigational inaccuracies and engine mishandling, coupled with contingency factors such as combat manœuvres, pressure cabin failure, engine failure, etc. As such it can only be a paper calculation which, in the case of pure jet powered aircraft, may be reduced by as much as 40 per cent. when allowance is made for all those factors previously ignored. The "operational" range can be said to be that which we are left with after allowance has been made for all factors previously mentioned.

The radius of action, or "strike" range, would, in most cases, be slightly less than half the "operational" range, although where the force may depart from a base in one theatre of operations and arrive at a destination in a different theatre, any target within its "operational" range can be attacked. An impressive "operational" range implies the overflying of large tracts of hostile territory, and an increased loss rate can be expected regardless of the efficacy of the enemy's counter-measures. This loss rate may be reduced in two ways: firstly, by reducing the period of time the aircraft is subjected to the danger of attack (by increasing the speed of the machine), and, secondly, in the early provision of the necessary devices to defeat the effectiveness of the enemy's counter-measures (anti-countermeasures). This can only be done through the medium of good intelligence, as the initiative lies solely with the enemy as to what form his counter-measures take and when they are employed. We must be prepared for their introduction and the necessary anti-countermeasures held in reserve before they are required operationally.

Bombing Accuracy

The need for the bomber force to be capable of successfully operating regardless of weather conditions best described as "zero-zero" emphasizes the provision of a means whereby its bombs can be accurately aimed at the target without requiring it to be seen by the human eye. The height from which we can expect the modern bomber to discharge its bombs from may well render it impossible to do more than visually identify the general area within which the target may lie. At night-time this will most certainly be the case and, this being so, the bombing techniques will most probably be the same for day as for night operations. In fulfilling the long-range bombardment role, the targets to be attacked will, in the main, be far beyond the reach of ground-based blind bombing devices situated in friendly territory. To depend upon these devices in the early stages of hostilities may well result in their capture by the enemy

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surface forces and their subsequent employment against ourselves. Only when that territory can be defended and held would it be wise to rely upon their assistance.

It will be necessary that the aircraft should carry within itself a blind bombing device which should be completely independent of a ground organization in its operational use.

The presence of a precision target within a built-up area will, in its selection for attack, present a difficult problem in its identification and destruction. Experience has shown that destruction for destruction's sake becomes a millstone around the victor's neck, for which he pays dearly at the end of hostilities.

The type of target to be attacked will govern to a very great extent the choice of bomb to be used against it, and it is extremely unlikely that the bomb with a free fall will be used. We may expect the missiles to be guided on to the target by either a mechanical or manual means, and in this respect it is interesting to consider the progress made by the United States culminating in the recent disclosure that a 12,000 lb. guided bomb has been perfected. On the few occasions that such a weapon was used by the Allies in the last war their possibilities were recognized, but owing to their limited use no final conclusions as to their efficacy were obtained.

The use of nuclear energy as the bomb's explosive power is widely assumed. Whether it will or not will depend to a very great extent upon the development of cheaper and simpler methods of production and upon the importance of the target to be attacked. It is extremely likely that a belligerent might resort to their indiscriminate use at the outbreak of hostilities in the hope of achieving a knock-out blow, but such an action presumes the inability of those attacked to retaliate in kind. It is doubtful that nuclear weapons will be used by the combatants on any and every target to be attacked. It is more likely that they will be used against large industrial areas, major ports and harbours, centres of government, administration and communications and certain military, naval and air bases. It is not possible here to pursue this subject farther, and only the very outer fringe has been touched upon.

Strategic Mobility

The post-war years, bringing with them their complicated international and economic problems, have stressed the necessity of restoring mobility to the modern strategic bomber force. Mobility of air forces can be classed as either tactical or strategical, and it is the latter that we are concerned with here. The power of movement from one operational theatre to another has tended to become increasingly difficult and slow with the increased complexity of air forces. The great financial cost of modern aircraft, weapons and equipment, and the need to make the best use of the forces available for Commonwealth and Western European defence has emphasized the need for a mobility of the highest order.

That the United Kingdom no longer provides an absolutely secure base of operations is commonly recognized and therefore our striking forces should be prepared to operate from bases elsewhere with a negligible loss of time. The provision of bases in certain strategic areas of the world, both within the Commonwealth and without, is necessary for the movement to take place. These bases should be equipped with all the necessary devices required to sustain a bomber offensive over a long period of time and be manned by "skeleton" staffs to maintain them at the required state of readiness. The provision of adequate defence forces, and the finances for their upkeep, will most likely be a matter

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for close co-operation between the Commonwealth and her Allies. The recent announcement of the willingness of members of Western Union and the Atlantic Pact to integrate their military forces is a stride in this direction.

Technical developments in the design of aircraft undercarriages may radically influence the complexity and cost of bases, and the caterpillar track can release us from the tons and miles of concrete runways to which the heavy bomber is at present tied. The effect of this upon strategic mobility would be tremendous. Behind the bases must be developed the industrial centres necessary for their maintenance, and of the forces that may operate from them, so that the distance over which they must be maintained is reduced to a minimum. It will also be necessary for the elements of organization and command to be provided and given the opportunity of exercising their functions by the regular movement, in peace, of bomber squadrons between the strategic bases established. The present training visits of Bomber Command squadrons to the Middle East is an example of the lines to be followed.

CONCLUSION

From this article can be drawn the outline of the shape of the strategic bomber force of the very near future, which today is in its stage of infancy and rapidly growing to its full stature. In size and numbers it may well be a small force, but nevertheless one which could influence the course of international affairs for the good of mankind and the attainment of world peace. This it may only do if it is capable of operating effectively and efficiently to instantly counter aggression, or the threat of it, wherever it appears. And this can only be achieved through the desire of peace-loving nations to join together in some form of international organization pledged to attaining and supporting world peace, and pledged to actively oppose any would-be aggressor.

In the United Nations we see such an organization on the grand scale which in recent years has become increasingly inefficacious and uninfluential in world affairs through the defection of one of its major members. But elsewhere we can see a smaller, regional organization, born of this defection, growing up through the Brussels Treaty and Western Union, and reaching maturity in a North Atlantic alliance which in many ways has done more towards the establishment of world peace than has its elder brother, the United Nations. It is through the North Atlantic Pact, and such other regional agreements that may come into being, that an effective strategic bomber force can be created capable of making a lasting contribution towards world peace and the security of mankind so long and eagerly awaited.

A CORRECTION

We regret that in "V.Cs. of the Air," in our October, 1950, Number, there were two regrettable misprints.

The article was on "Flight Lieutenant David Samuel Anthony Lord." (We regret the omission of the "Y" from Anthony.) By an oversight in reading the proofs, his father's regiment was stated to have been "The Royal Fusiliers." It should have been "The Royal Welch Fusiliers."

We offer our apologies for such carelessness.—EDITOR.

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MORALE—ITS DEPENDENCE UPON CONFIDENCE

By Flight Lieutenant A. B. Avery

ALL other factors being equal, morale is the factor which determines the victor in modern warfare. In fact, it is not too much to say that a belligerent whose morale is superior to that of the enemy can often overcome superior arms; as actually happened in General Wavell's great advance against the Italians in North Africa in 1942. It therefore is apparent that the raising of morale to its highest point, and its maintenance there, is one of the most important, if not *the* most important, tasks of a commander.

Morale depends upon *confidence*. It is the only factor on which morale depends. This is a simple but sweeping statement, but in the following analysis it will be justified.

CONFIDENCE IN THE JUSTICE OF THE CAUSE

This should not be difficult to inculcate in a democracy such as ours. Our national policy is, in the end, decided by us. The national policy is that endorsed by the majority of the adult population. In the last war, the nation was overwhelmingly convinced of the necessity to call a halt to German expansion. It was sickened by the vile and bestial measure of repression of helpless minorities, and shocked and revolted by the many and flagrant breaches of faith committed by the Nazi Government. The conscience of the nation was stirred, and, convinced of the justice of its cause, we embarked ill-armed and unprepared into a life or death struggle. Never was morale higher than in the darkest days; and the main factor in our survival was our faith that we were fighting for the right.

This indomitable courage is evinced only when men fight for a just cause. It was evinced by the Kaiser's threat in 1914, by Napoleon's extinction of freedom in Europe in 1799 to 1815, during the wars which led up to the defeat of the Spanish Armada, and on countless other occasions. But, when the nation is not convinced that it is engaged in a just war, a very different situation arises. How superior were our forces to the "rabble in arms" of the American colonies in 1776, but how easily were our forces defeated! Largely mercenary, and not convinced of their right, they were easily overcome.

A commanding officer is responsible for his command's readiness for war. It therefore behoves him to keep his men informed of the National policy and the reasons for it. This may be done by Current Affairs and Citizenship training and lectures, which will do much to keep his men abreast of world affairs and our country's and Empire's part in them. I would ensure that *interesting* talks, lectures, etc., on these subjects were given.

CONFIDENCE IN ARMS AND EQUIPMENT

It is considered that this factor takes second place; and it is indeed vital. The pilot who knows that his aircraft is the master of his enemy's; the technician who knows that his machine is more efficient than his enemy's; the soldier who knows his weapon is more accurate or powerful than the adversary's—he goes into battle expecting to win—and generally does so.

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Confidence in our arms and equipment is fostered in the first place by a thorough knowledge of them. This comes from constant training and the promotion of healthy competition between squadrons, flights, sections, watches—whatever units you will. A commanding officer should ensure that all under his command are proficient—and more than proficient—in their weapons and equipment. He should promote a spirit of competition which he may encourage by organizing competitions between flights and sections for trophies not in themselves valuable, but for the honour they represent and the pride in their possession. He should ensure that regular training is carried out and should pay special attention to newcomers. Ultimately, such training breeds pride in self and Service; and this spells confidence in our weapons and equipment—and *ourselves*—most important of all!

CONFIDENCE IN LEADERSHIP

The word "King" comes from an Anglo-Saxon word meaning "the man who can." The leaders in the Service, high and low, must inspire confidence by their competent familiarity with the duties of all those under them. The leader must be "The Man Who Can."

Good Faith is an essential to leadership. Make up your mind, as wisely as you can and dispassionately, and make your decision or give your ruling, and *stick to it!* Vaccilation is fatal to leadership and confidence. Many a seemingly hopeless situation has been saved by resolute maintenance of the course of action. When you give your word, *keep it*, cost what it may. As a commanding officer I would use my best endeavours to make promises, hard or easy, by myself or my subordinate commanders, absolutely inviolable. This is the basis of personal confidence.

Keep your men's welfare constantly in mind. I well remember as a cadet in my school O.T.C. being told repeatedly: "You will see your men fed and accommodated before yourself; you will put their well-being and safety before your own; or you will never achieve commissioned rank, or, having achieved it, hold it." As a commanding officer I would insist on this attitude from my subordinate commanders and N.C.Os., and deal harshly with any who fell from this high standard, which is essential to the aspirant to leadership.

GENERAL

Under these broad headings come all aspects of Morale. The leader who practises the ideals mentioned above—who attends to the main things—will, of course, automatically look after the less obvious ones; he will automatically see that his men have a sufficiency of entertainment, sports and recreation, and he will take a leading part in these activities. He will, as a matter of course, attend to his men's private cares and troubles by encouraging even the least of his subordinates to approach him in family and personal matters. He will see that he and his subordinate commanders are aware of their responsibilities in this direction, and will ensure that they fulfil them.

These remarks on leadership would not be complete without mentioning the need for the human outlook and philosophy on life which spring from faith. Positive, active, Christianity has just as great a place in the world as it ever had, and the leader who practises it and observes the other essentials which I have mentioned will find himself that most fortunate of all men—a leader, competent, resolute, and well-beloved by all whose privilege it is to serve under him; and they will serve him faithfully and well.

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KNOW YOUR ALLY

THE FRENCH AIR FORCE

By General L. M. Chassin

THE 1940 WAR

IN 1940 the French Air Force engaged in battle the vastly superior numbers of the German Luftwaffe. They possessed but 600 fighters and 100 bombers with which to withstand the onslaught of 3,000 enemy aircraft. Despite their numerical inferiority they inflicted very heavy losses upon the Luftwaffe, destroying no less than 919 enemy aircraft, with a loss of 406. When hostilities ceased in France, General Vuillemin decided to send all available military aircraft to North Africa. Six hundred crossed the Mediterranean between 17th and 29th June, hoping to continue the struggle.

THE ARMISTICE PERIOD

During the armistice the French Air Force, three-quarters of which was stationed in North Africa and French Occidental Africa, had a relatively important number of squadrons (sixteen fighter, thirteen bomber, six reconnaissance and three transport), comprising approximately some 600 aeroplanes and the means of carrying on with the training of 1,250 pilots; which training made it possible, when the great moment came, to rejoin the battle without undue delay.

Meanwhile, General de Gaulle and General Valin had raised and organized a Free French Air Force in the Empire which, by the end of 1942, comprised "The Alsace," "The Isle de France" and "Normandy" fighter squadrons, and "The Artois" and "Picardy" coastal squadrons, approximately 130 military aircraft. In addition, there were many French airmen serving individually with squadrons of the Royal Air Force. Having fought alongside their French allies throughout the hardest period of the war, the British know how gallantly these representatives of France acquitted themselves in battle.

REARMING THE FRENCH AIR FORCE

In 1942, when the French Forces in North Africa re-entered the war, our old Liore 45, our Douglas, our Glen and our Bloch 174, which our mechanics had miraculously succeeded in keeping serviceable, were immediately sent into action in the Tunisian Campaign. In a symbolic gesture, in December, 1942, the Americans rearmed "The Lafayette" Squadron with the Curtiss P.40, which then joined in the operations at Souk-el-Arba.

After the A.N.F.A. Conference, at the end of January, 1943, a rearmament plan for the French Air Force was agreed to by the Allies. The Americans undertook the majority of the programme: two medium bomber wings of three squadrons each, nine fighter squadrons and two reconnaissance squadrons. The British offered us two squadrons of Halifax (four-engined) heavy bombers, and three Spitfire fighter squadrons. From her own resources France was to undertake the basic training of her old pilots, young recruits being sent to the U.S.A. and Canada.

From then on progress was rapid. Ten fighter squadrons (260 aircraft), armed

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CHARLES LECHERES
Chef d'Etat Major, General de l'Armée de l'Air

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with the the Airacobra P.39, the Curtiss P.40 and the Thunderbolt P.47, were equipped in Africa during 1943. At first, these squadrons were used for the protection of Allied shipping in the Mediterranean, then gradually engaged in tactical support of ground operations with our armies, first, in Corsica and Italy, and later in France. In 1944, squadrons of medium bombers composed of about 100 twin-engined Marauders B.26 operated with the Mediterranean Tactical Air Force. They quickly became noted for the precision of their bombing, and after the French landing they formed an independent bomber group.

After a long period of training in England, the two heavy-bomber squadrons went into action and played their part in the "flattening" of Germany, as well as giving support to the ground operations in Normandy. Armed with the Lightning P.38, a high-altitude photographic squadron streaked through the French skies for more than a year preparing for the liberation of our country. These were members of 2/33 Squadron, in which Major de Saint-Exupery was serving, until posted as missing on 31st July, 1944, in a mission over Grenoble. Meanwhile their comrades, armed with Spitfires, were operating over the battlefields of Italy and France on tactical reconnaissance. In addition to these activities, a legion of small observation aircraft (the Piper Cub) were extremely useful to our artillery throughout the Italian Campaign, directing their fire on to enemy objectives.

When the French Air Force returned to France it consisted of fourteen fighter squadrons, ten bomber squadrons, two reconnaissance squadrons and two transport squadrons, as well as six anti-aircraft groups (200 guns) for the defence of our airfields; and three Parachute regiments, one formed in Algeria, the other in England.

Step by step, our Air Force regained its independence. At first our squadrons were used in Allied organizations, our personnel in squadrons under the command of American or British officers; but gradually, as soon as we were capable of maintaining our own equipment and supplies and able to form the necessary staffs, there were French bomber and fighter squadrons grouped in their own organizations, under Allied command.

After landing in our own country we made further progress towards unification of the French Air Force, as the bulk of the squadrons went to form the 1st French Air Command, under General Gerardot, and with the 12th American Tactical Air Force constituted the First Tactical Air Force, which was entrusted with the support of the American Seventh Army and the French First Army operations which were under the command of General Devers.

After the liberation, new squadrons were formed in France with equipment captured from the Germans or that supplied by the Allies. The Commander of the Atlantic Air Forces built up, during the course of the operations of Royan and Verdon, five new fighter squadrons, two bomber squadrons and one reconnaissance squadron.

Until the end of the war our Air Force was continuously engaged in operations with remarkable success. Between 1940 and 1945 our fighter squadrons destroyed in combat 659 enemy aircraft. Our bomber squadrons dropped 26,000 tons of bombs.

POST-WAR

After the war our first task was to "tidy up our devastated home," to assess the damage, to reoccupy our Air Force establishments and to rebuild again our aircraft factories; at the same time it was necessary to formulate a programme for the development of the French Air Force.

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It was soon apparent that the economic reconstruction of France had an uncontestable priority. National Defence and, in particular, aviation had to take second place. It was necessary, therefore, to make severe cuts in our military expenditure. At that time the Government considered there was no danger of another war, and made the primary responsibility of the Air Force the security of the French Empire and her communications. In consequence, the retention of bombing squadrons was considered superfluous, and the Marauders and Halifaxes were converted for use as transports. Precedence was given to transportation and other squadrons for "police and security."

During this time aircraft construction was restarted and an ambitious programme was announced. Responsible authorities estimated that in about three years, that is to say, about the end of 1948, the fighter aircraft in our squadrons would be replaced, to some extent, by French jet aircraft similar to those of the British and Americans. In order to fill the gap during those three years, it was agreed with the Royal Air Force (the Hartemann-Dickson Agreement) that the British would let us have a sufficient number of aircraft, engines and spares, until such time as the French types were available.

If, in 1945, the immediate need was for transport aircraft, by 1946 events in Indo-China obliged us to consider more and more urgently the need for an Air Force for the Far East. However, the danger of another war having rapidly arisen, the French Air Force, reduced by 90 per cent., had to proceed with the costly reconstruction of their destroyed bases, and the radio equipment of the French operational area.

The Government now made priority number one the air defence of France and realized the need for an air force capable of maintaining command of the air and providing tactical support to ground forces. By an arrangement with the British, the de Havilland Vampire was selected for the initial re-equipment of French fighter squadrons, while waiting for the first French fighter aircraft, of which the Marcel Dassault Ouragan has proved to be the best.

Photo: S.C.A. France

ANDRE MAROSELLI
Secretary of State for Air

PRESENT ORGANIZATION

At the present moment the organization of the French Air Force is as follows: Mr. Maroselli (the Secretary of State for Air) is responsible for the Air Force and at the same time for all aeronautical construction (military and civil). This Minister has directly under him the Etat-Major Général (Armée de l'Air), the Directors of Technical Design and Supply, Personnel, Equipment and Medical Services. The "Etat-Major Général" is under the command of Général d'Armée Aérienne

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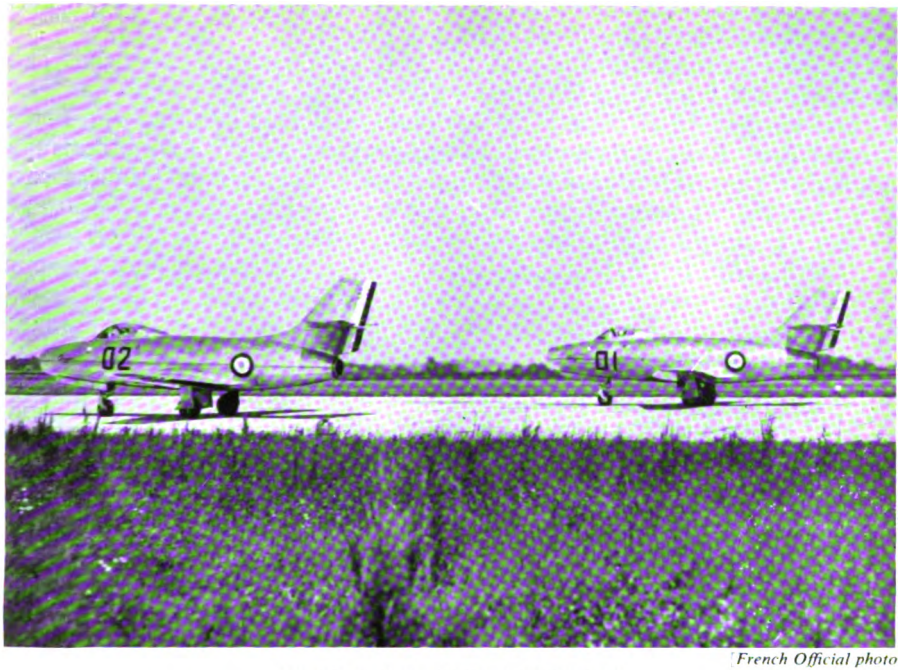

French Official photo

D'ASSAULT 450 "OURAGAN"

One of the most modern "Interceptor Fighter" aircraft of the French Air Force

THE "ESPADON"

Another recent type of jet fighter aircraft of the French Air Force

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Charles Lecheres, assisted by Général de Division Aérienne Pierre Fay, who is given the title of Major Général de l'Armée de l'Air.

The Air Force comprises a certain number of Territorial Commands and Reserve Commands.

From the Territorial point of view, France is divided into four Air Force regions (Dijon, Paris, Bordeaux and Aix-en-Provence). North Africa forms the fifth region. French Occidental Africa, Equitorial Africa, Oriental (Madagascar) Africa and Indo-China are independent Air Force commands.

From an operational point of view the main commands are as follows:

The 1st Air Force Division (Général Bodet), comprising most of our Tactical Air Force.

The Air Defence of the Country (Général Bailly), which corresponds roughly to the Fighter Command of the Royal Air Force.

The G.M.M.T.A. (Groupement des Moyens Militaires de Transports Aériens: Colonel Dechaux), which corresponds to the Transport Command of the Royal Air Force.

The Commandement Supérieur des Ecoles de l'Air (Général L. M. Chassin), which combines the Technical Training and Flying Training Commands.

Although the effective strength of the French Air Force has been reduced since the liberation from 140,000 in war time to 65,000 in 1950, the recent vote in Parliament known as the "Plan Quinquennal," has opened up prospects of considerable development.

The "Plan Quinquennal" (which, under the urgency of the moment, may be completed in three years instead of five) should give the French Air Force, by 1955 at latest, a strength of 2,500 military aircraft, of the latest types, most of them jet fighters, a suitable number of airfields and the requisite chain of radar stations for the operation of this force. This plan provides for an air force in the region of 130,000 men. Its cost will require a budget of about 150 milliards per annum during five years.

Already all our fighter pilots have been through a jet-conversion course at Mont-de-Marsan. Our personnel have already taken part several times, together with their allies of the Brussels Treaty, in combined exercises, where they have shown that they will do their utmost to maintain the high standard of their glorious Royal Air Force comrades. It is hardly necessary to add that sport plays an important part in the training of our pilots, and every year in international competitions they compete in boxing, football, rugby and fencing with their British and Belgian comrades. Thus, a fine relationship of "camaraderie" has been established and maintained since 1945, between men who have together victoriously defended their freedom against the aggressor, and would be ready, if necessary, to do so again tomorrow, a united band of brothers, with the same ardour, the same forcefulness of purpose and, we hope, the same success.

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THE FIGHTER CONTROL BRANCH IN WAR

By Wing Commander F. J. Trollope, M.C.

In the nineteen-thirties, with fighters equipped with H.F./R.T. sets for air-to-ground and air-to-air communication and with warning and tracking of aircraft provided by the Observer Corps—later to achieve Royal status—operations rooms were formed within each of the then small fighter sectors in the United Kingdom. In air exercises these operations rooms were manned by airmen normally employed on quite different duties, and operations were controlled in the first instance by the signals officer and later on by a pilot selected temporarily for the job. In this early and relatively simple organization can be discerned the foundation of the complex, widespread and, let it be said, costly control and reporting systems that exist today.

Such systems are to be found at home and in all oversea theatres, their complexity varying with the area to be defended against air attack, with the size of the fighter force and anti-aircraft defences deployed and with the scale of radar equipment and communications provided. They are costly in sites, in buildings, in equipment and not least in the man power required to control and operate them, to maintain their technical equipment and to provide administrative backing. With the formation of the fighter control branch, the officers continuously employed in controlling duties in these C. & R. systems have been accorded the status of a separate officer branch.

To understand their duties it is essential first to understand the organization and the working of an air defence system.

The Air Defence Commander is responsible for the air defence of a defined area. He delegates detailed responsibility to commanders of lower formations, but retains, in so far as minute-to-minute tactical control of operations is concerned, the responsibility for reinforcement of one sector by others, within his area of responsibility. This responsibility the Air Defence Commander discharges, either personally or through his representative, in an operations room in which the overall picture of the air battle is currently displayed. The Sector Commander, from his operations centre, decides what action shall be taken to deal with each enemy air attack. It is with the implementing of the orders issued by the Sector Commander and with the provision of the air situation picture on which his orders are based that the duties of the officers of the fighter control branch are concerned.

With the advent of radar, the area over which the reporting and tracking of aircraft could be achieved became considerably expanded, and these processes became much more complicated, in comparison with the detection and tracking of aircraft by sight and sound previously undertaken by the Observer Corps alone. The supervision of the working of a reporting radar station is in itself a specialized task and the officer radar supervisor remains to this day a specialist, provided for by a sub-branch of the Fighter Control Branch. As might be expected, these officers are enabled to graduate, after a period of service as radar supervisors, to the wider responsibilities of the main branch.

The collection and selection of reports of aircraft positions is the next step in the compilation of an air situation picture, the final step being the identification of the tracks produced. These several duties are combined under the

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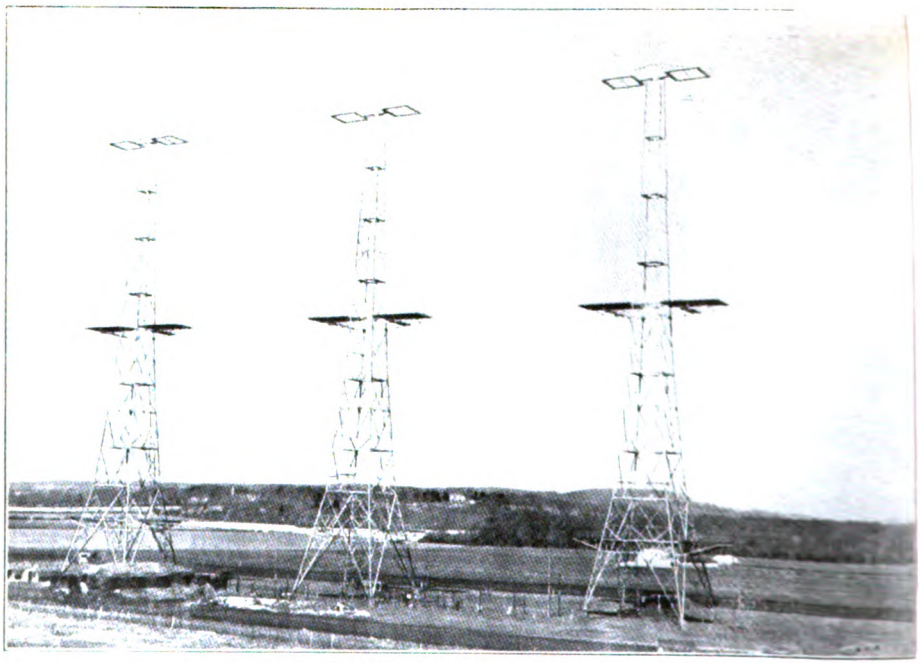
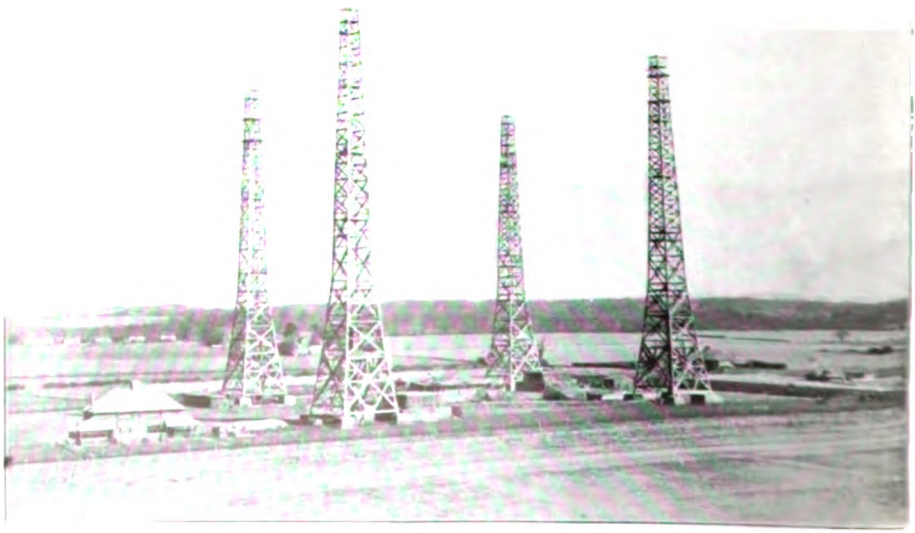


C.H. Transmitter Towers



C.H. Receiver Towers

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generic title "Reporting." Under the generic heading "Control" are included the tasks of briefing interception controllers and allocating to them fighters and the frequencies on which they are to be controlled, the control of aircraft in making interceptions, providing navigation assistance to fighters where required, exercising radar surveillance for safety purposes, the issue of orders for controlling gun defences in accordance with the Sector Commander's directive and the conduct of a close liaison with neighbouring sectors, by which the defence of individual areas is integrated to achieve the defence of a theatre as a whole.

From this brief summary it can be seen that the knowledge required by officer personnel employed in a control and reporting system covers many aspects. They must know in detail the control and reporting procedures and the capabilities of the system, be expert in the various methods of controlling fighters, be fully briefed on current fighter tactics, have a detailed knowledge of the equipment and performance of all types of aircraft which they control, of enemy aircraft and their tactics, of radar and of A.A. defences. They must also understand fighter navigation and elementary meteorology. This knowledge and the skill that translates it into practice is not acquired overnight. Although many of the entrants into the branch are ex-G.D. officers, who bring with them a considerable background of knowledge, all newcomers are required to take an *ab initio course*, and thereafter they complete training within a sector before their suitability for employment in C. & R. duties is finally assessed. By that time officers are expected to have become proficient in reporting duties, as interception controllers, and to have built up a wide knowledge of the air defence system. In due course they qualify for employment in senior capacities in which their work is concerned with co-ordination and the allocation of tasks.

One of the greatest obstacles to training is the lack of adequate aircraft hours for providing fighter controllers with sustained intensive practice, because many aspects of fighter training, such as aerobatics and gunnery, do not immediately concern the C. & R. System. For this reason some reliance has always been placed on synthetic training devices and it is probable that even greater use will be made of them, as more realistic and more flexible ones become available. It is true, however, that these aids are not, nor can they be, a complete substitute for the real thing. The object of peace-time training of fighter controllers is to provide what would in cricket parlance be described as "all-rounders," and for a time officers are employed alternately on control and reporting duties. Thus, they become fitted, as senior officers, to act as advisers to Sector Commanders on C. & R. matters or for employment on staff duties.

The Fighter Control Branch now includes a number of officers employed on these duties in the war years and, in addition to ex-G.D. officers and ex-radar supervisors, some National Service officers, who are commissioned on passing the *ab initio* course, and a small number of W.R.A.F. officers. The percentage of W.R.A.F. other ranks employed in the system in the U.K. is much lower than during the war, but a large degree of W.R.A.F. manning is acceptable and there are many officer posts for which W.R.A.F. officers have proved themselves to be specially suited.

In war-time the pressing need to employ personnel effectively after the minimum period of training inevitably leads to specialization. On the outbreak of the 1939-45 War, the existing part-time system in the U.K. had to be manned twenty-four hours per day and, to achieve this, personnel were employed full-time on a four-watch basis. At the outset most of the officers were found from the G.D. list, but a large percentage of officers without flying experience were

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[Air Ministry photo

General view of a Fighter Control Operations Room

[Air Ministry photo

Airmen and airwomen at work on a plotting table in **Headquarters Fighter Command's** *Operations Room*

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brought in as the organization grew. These were commissioned in the Administrative and Special Duties Branch, an arrangement which persisted until after the war, when the Aircraft Control Branch was formed to include air traffic control officers and fighter controllers. Subsequently this branch was split up, with the transfer of air traffic controllers to the G.D. Branch and fighter controllers to the Fighter Control Branch.

In the event of war, establishments will be filled by the regular elements, by R.Aux.A.F. officers of the fighter control units and by R.A.F.V.R. officers, supplemented, if necessary, by reservists with last war experience. The need to call upon the latter category is decreasing as the numbers recruited in the fighter control units and in the R.A.F.V.R. increase.

Arrangements for the training of auxiliaries and reservists are continually improving. Already there are twenty-five fighter control units in the major centres of population in England, Scotland and Wales, and one in Northern Ireland. Spare-time training, both practical and synthetic, is carried out, summer camps are held during which personnel undertake watch duties on active stations, and opportunities are given for participating in major air defence exercises. The number of C. & R. personnel in the R.A.F.V.R. is at present small, but with the formation in the near future of reserve flights on all active, peace-time C. & R. stations, offering active participation in day-to-day training, a substantial improvement in the rate of recruiting may be expected.

In the last war the first task was to expand the existing C. & R. system to cover the whole of the U.K., and by 1941 six groups had been formed in Great Britain and one in Northern Ireland. While this expansion was in progress the Battle of Britain was fought, and the fundamental soundness of the C. & R. organization proved. Personnel employed in many of the radar stations and operations rooms were called upon to work through a period of intense activity that lasted several weeks, and on occasion stations were subjected to air attack.

Night raids disclosed the need for control of fighters direct from a radar display, and a suitable one was developed and in operation in 1941. Later, low-level raids on coastal targets made imperative the thickening-up of radar cover by the provision of low-looking radar equipment. In the meantime, mobile radar convoys had been assembled both for raid reporting and aircraft control, and had been dispatched to the Middle East and Far East, and played their part in these theatres. The defence of Malta was conducted from the island's operations room, served by its radar reporting and control units.

The need of C. & R. facilities in operations which involved the invasion of enemy-held territory was foreseen and mobile C. & R. facilities were landed over the beaches in landings in North-West Africa. In the invasions of Sicily and the Italian mainland, radar convoys were again landed at the outset, and, later on, this established principle was followed in the invasion of the Normandy beaches. In the early stages these units exercised control of fighters on standing patrols, operated from bases elsewhere, and were provided with a minimum of communications. As the build-up of a beach-head progressed the C. & R. organization was expanded and the scale of communications increased. Units remained mobile, however, and ready to move forward at a few hours' notice, those in rear areas "leap-frogging" over those in front in order to keep the system operating. In these tactical theatres of war, where fighter forces operated in support of the army, and where offensive and defensive fighter operations overlapped, the control of both was exercised through a single mobile C. & R. organization, of which the main element, the Group Control Centre, was sited near the Army/Tactical Group Headquarters. Of the offensive opera-

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tions, only a percentage was closely controlled, so great was the volume of air traffic, and by far the most important of those controlled were the sweeps carried out over enemy territory. History was repeating itself, for the early sweeps over France in 1941 were similarly controlled from radar stations in Southern England.

In the Mediterranean and off the Normandy beach-heads control of fighters was exercised from ships whilst the organization ashore was being set up, and a seaborne unit was on its way to the Far East, when the war in that theatre ended. Air transportable radar for C. & R. purposes was designed and fitted in a glider, and such a unit was landed at Arnhem and gave a good account of itself, though in an unaccustomed role.

From the diverse nature of these operations, the principle is clearly established that wherever fighters operate, or need to operate, in a defensive role, an organization on the ground is required to direct them in the air. In a fully built up C. & R. system this ground organization should provide warning and control, to enable the fighter force to maintain its states of readiness on the ground and not fritter away its strength on standing patrols. In a newly organized system, such as in a beach-head, it may be possible to provide control facilities only and standing patrols may be an essential feature of defence.

In another war, if there should be one, it is not possible to foresee all the demands that will be made on fighter forces and on the C. & R. systems that support them. It is clear that a fully developed system in the U.K. and in overseas theatres must be manned for twenty-four hours a day, with its personnel fully trained, at the outbreak. The nature of subsequent operations will determine the need and character of C. & R. facilities required. Changes in radar performance, in control methods, in aircraft performance, equipment and tactics are all reflected in the composition and activities of a C. & R. organization. Its functions in achieving economy of force and concentration of effort will, however, remain. Of the personnel concerned with its operation, it is reasonable to suppose that their lot will not be a dull one.

WINTER SPORTS HOLIDAYS FOR THE SERVICES

In view of the great interest shown by all three Services in the holiday scheme arranged during the last two seasons by the R.A.F. Winter Sports Association, it has been decided that the scheme in future will be run by the Combined Services' Winter Sports Association, the Chairman of which is Air Marshal Sir Robert Foster, K.C.B., C.B.E., D.F.C.

Two schemes have been arranged for the 1950-51 season, one for holidays at St. Moritz and the other for holidays at Chamonix. Both schemes will be divided into six sixteen-day periods, from early January to mid-March. The cost will be £49 for St. Moritz and £36 for Chamonix, including travel, first-class hotel accommodation, sports facilities, such as ski-ing, skating and bob-sleighing, hire of sports equipment and, for those who desire it, tuition in ski-ing.

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LIFE IN AN AIRCRAFT CARRIER

By Rear-Admiral H. E. Horan, C.B., D.S.C.

ANY modern ship of war is a very complicated piece of mechanism. It is also a community in itself. The ship's company of a battleship compares very favourably with that of a small village, and it is presided over by a benign autocrat, known as the captain. Now, an aircraft carrier is a village with a complete air station tacked on to it. When mention is made of a "complete air station," this means that there is a landing ground, repair and maintenance facilities for aircraft, stores of ammunition and fuel, and, finally, an anti-aircraft battery to defend the lot. Further, the whole is highly mobile and can proceed from place to place on the surface of the ocean at high speed. From this short summing-up it is clear that an aircraft carrier is a very expensive affair, and to combine all its functions into a small space is a matter of very careful construction and organization.

At the end of this article will be found a diagram showing how, from the personnel point of view, the whole organization is arranged. Actually, the thing to remember is that the ship's company is composed of the normal personnel you would find in any ship whose job is to run the ship. Those who work under Commander (Air) come from the officers and men trained specially for naval aviation. There is no real hard and fast division as might be suggested by the diagram; many of the duties are amalgamated, and, naturally, the whole must work as a team (and a happy one at that) under the captain.

When one sees an aircraft carrier alongside a dockyard wall one is at once struck by the size of the ship. This is necessary because aircraft require large hangar space, and the more aircraft that can be embarked, the greater the striking power of the ship. Also, size is important, as the bigger the ship the steadier the platform she is in a sea-way. But even this great size is only just enough to house the personnel and material required for the efficient operation of the aircraft, which is the primary role the ship is designed for. Every inch of space is utilized, and the accommodation of the personnel is not on such a lavish scale as is to be expected in any other ship of comparable displacement.

Before proceeding to describe the activities that take place when the ship is operating a word must be said about the Engine Room Department. Of necessity the propelling machinery is a large installation, as for flying operations high speeds are essential, not only for getting the wind speed over the deck but for catching up with the Fleet after the carrier has had to turn into the wind for "landing on," when it is highly probable that is not the direction in which the Fleet is proceeding. It is fair to say that whenever flying is taking place full power is always at hand and all boilers are connected. This means the engine-room personnel are in two watches and continually on their toes to get the very best they can out of the "engines." This alone puts a great strain on the machinery, but with rapid increases and decreases of speed, which are part of the business of flying, wear and tear on the working parts is much more than normal and the most careful maintenance is required. That the engine-room personnel rise to the occasion goes without saying. They one and all know the importance of their job and take a pride in doing it well. If any spur were necessary to the enthusiasm of the "Chief" and his department, the knowledge that their shipmates' lives and the efficiency of all operations depends to a great extent on their efforts is always present.

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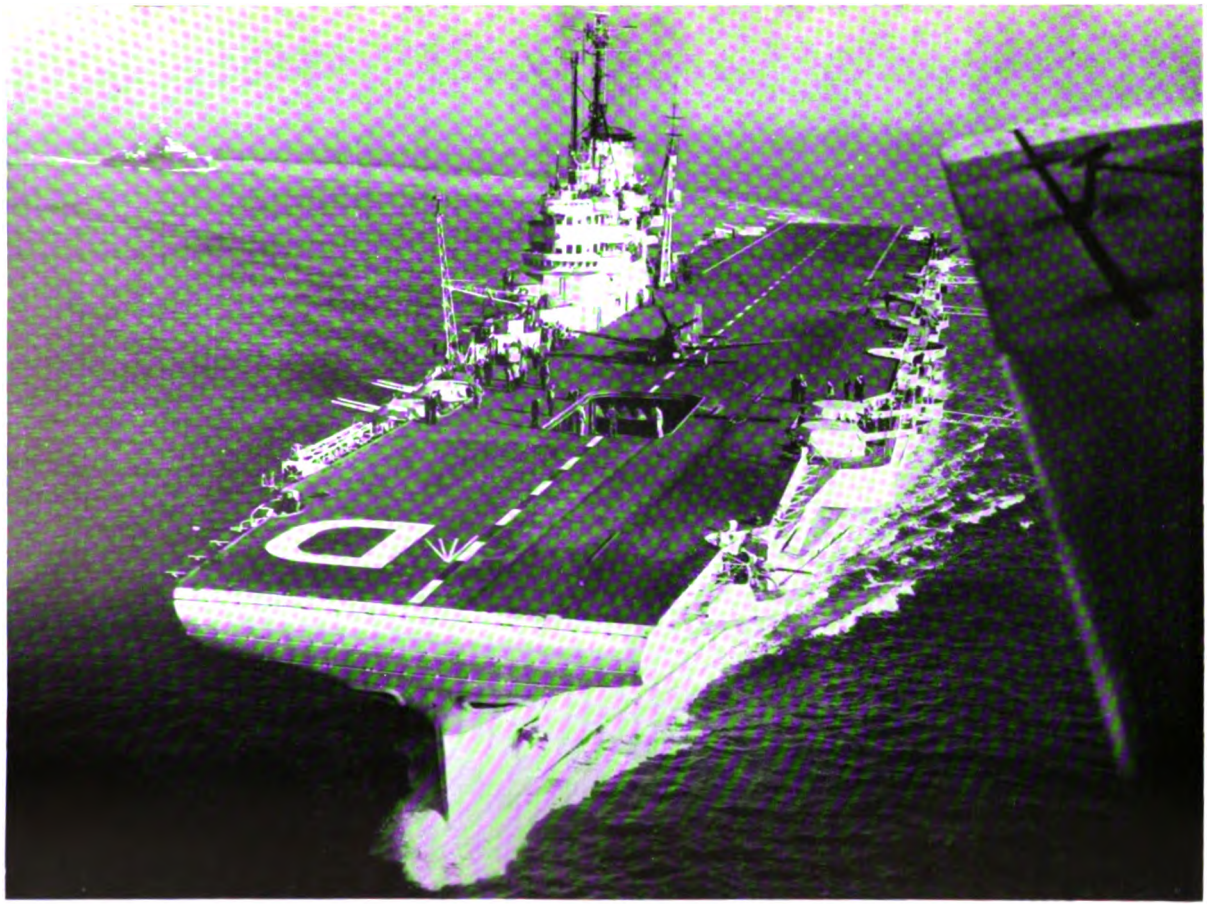

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H.M.S. "Illustrious" with attendant destroyer

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TYPES OF CARRIERS

In the Royal Navy there are nowadays three types of aircraft carrier:

(*a*) The Fleet Carrier.

(*b*) The Light Fleet Carrier.

(*c*) The Aircraft Repair Ship.

Examples of the first are the *Illustrious, Implacable, Indomitable,* etc. These large ships are armoured and have two hangars. They must be looked upon as components of the Main Fleet.

On the other hand the Light Fleet type is not armoured and has only one hangar, and its role is that of convoy protection.

A product of the last war, the Aircraft Repair Ship is really a Light Fleet type but is fitted with the necessary machinery for carrying out major aircraft repairs. They would normally operate with the "Fleet Train," i.e., the collection of supply, repair, ammunition ships and oilers that are necessary to maintain a fleet in the absence of a base.

SPECIAL APPLIANCES

When visiting an aircraft carrier the first thing that strikes the eye is the flight deck. This is the "air-strip" from which all flying operations take place. It extends over the whole ship with a considerable overhang over both the bow and stern. These overhangs are "rounded down" and give the ship an odd appearance. Their design is a most important problem. They must ensure an even air flow over the deck as any form of turbulence thereon is most dangerous.

In the flight deck are the two lifts, one forward and one aft. These are the means for getting the aircraft from the hangars or back to them, and can be hydraulically or electrically operated.

Across the flight deck are stretched a number of wires. These are known as the "arresting gear" and can be raised or lowered as required. They come into use when an aircraft is landing on. The aircraft lowers a hook which takes in the wires and brings the aircraft to rest in a short distance. The necessary spring effect is produced by rams which are set to bring the aircraft to rest without putting undue strain on the frame of the machine.

Another device you will find on the flight deck is a safety barrier. When flying-on aircraft at short intervals the aircraft are parked at the forward end of the flight deck. As each aircraft stops the safety barrier goes up, so that if the following machine fails to pull up in time it is stopped before it runs into the machines that are already parked.

Finally a catapult is fitted on the forward end of the flight deck which is used to give the aircraft flying speed if for any reason the wind speed over the deck is not enough for the aircraft to take off.

In addition you will naturally find all the other appliances handy which are usually connected with any landing ground. Tractors, cranes, crash trollies, and fire-fighting equipment are all available. In addition, fuelling points are fitted and a ready-for-use supply of ammunition for quick replenishment is also on hand.

To put it bluntly the flight deck of a carrier is fitted with "every modern inconvenience."

OPERATING AIRCRAFT

On the starboard side of the flight deck is situated the "island structure." In any other form of warship it would be called the "bridge." Here is the position

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from which the ship is handled and in this structure you will find the following:

(*a*) Operations Room.
(*b*) Aircraft Control Room.
(*c*) Aircraft Direction Room.
(*d*) Flying Control Position.

It is clear from the names the above are given that they contain the officers who form the "brain" of the whole organization.

In the Operations Room the plans are hatched. Then the Aircraft Control Room staff controls the movements of all aircraft on the flight deck and in the hangar, their refuelling and rearming. When the aircraft are airborne the Aircraft Direction Room takes over the radio control of all aircraft and keeps a plot of their movements, while the Flying Control Position looks out for the aircraft in the immediate vicinity of the carrier and regulates the traffic.

OPERATIONS FROM A CARRIER

Operating aircraft from a carrier is a "totally different kettle of fish" from doing the same from the ground. The first thing to remember is that the "airstrip," i.e., the flight deck, is tiny in comparison with what you find ashore. Then there is the fact that this flight deck is in a ship and the latter may be pitching and rolling in a sea-way. To avoid attack by submarines the ship may have to carry out complicated manœuvres at high speed. Finally, the drill of the flight deck and hangar parties must be of the highest order so that the time of "turning round" an aircraft is reduced to a minimum. In fact, it can be truly said that the work and efficiency of these two parties can make or mar an operation.

With really good flight-deck party drill, aircraft can be flown off at intervals of as little as ten seconds. But other factors such as wind speed over the deck and how the aircraft are ranged affect this time. Catapulting takes longer but does enable aircraft to be flown off in low wind speeds.

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A Meteor landing on

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"Landing on" times depend largely on good drill in the ship's air circuit and good "batting." The latter, which is really a matter of guiding the incoming aircraft from a position on deck, is quite remarkable to watch. An officer by means of hand signals tells the pilot what to do to make a perfect landing. To the layman the "batman" performs movements which bring to mind a ballet dancer, and the result of his efforts is that the aircraft touches down in the correct attitude, at the right speed, and catches an arrester wire. With everything working well, the interval between aircraft landing on is about thirty seconds.

OPERATIONS IN WAR

It was in the operations in the Pacific that the real test of our aircraft carriers and naval aviation took place. Here the carriers, working with those of the U.S.N., carried out continuous operations off the enemy coast.

The normal routine for these operations was that the carrier worked continuously in close proximity to the enemy for a few days and then moved to the Replenishment Area and met the advance units of the Fleet Train, for one day, to refuel and replenish. During all this time the ship was under the constant menace of submarine and air attack. This routine continued for months on end so it is fair to say that a strenuous time was had by all.

A fair example of this will be seen in the following remarks. The carrier arrives in the operational area ready for action. Everything has been made ready during the dark hours and in a complete black-out. On the first day there is the necessity for dawn patrols to intercept dawn attacks and to locate and attack submarines. These are accordingly flown off before first light.

Away go the patrols, and the aircraft for the "planned strike" are ready. These leave at first light accompanied by their escort of fighters. While they are away constant patrols are maintained and then the striking aircraft get back. At once they are landed on and the next "strike" prepared. This has been carefully planned, but of course there must be last-minute alterations due to defects or damage to the aircraft which have returned. So everything is a matter for quick decisions and really good team work by the staff and maintenance personnel. As soon as possible the second strike is launched and so the business goes on with the added complication that the fighter and anti-submarine patrols will be requiring reliefs.

Shortly before dark the dusk patrols will be flown off, all other aircraft will land on and be refuelled and rearmed. After dark the dusk patrols are landed on and the ranging of aircraft for the next day starts. It is now that the planning staff get busy. Alterations have to be made owing to damage and casualties, briefs prepared, and they are lucky to get any sleep at all.

In addition to the planning staff the aircraft maintenance personnel have an all-night session (there are no "union hours") and by dawn you find the aircraft ranged, the pilots briefed and everyone "teed up" for another exacting and exciting day's work.

The strain on the personnel of an aircraft carrier during operations is severe. Aircrews in particular suffer from operational fatigue, and whole groups and squadrons are relieved in the visits to the Replenishment Area. The aircraft and maintenance personnel always remain with the parent ship.

PEACE TIME

In peace time life in an aircraft carrier is by no means so exacting. The 24-hour day necessary for long periods in war only comes into play when flying operations are taking place. These latter are concentrated when the fleets go on

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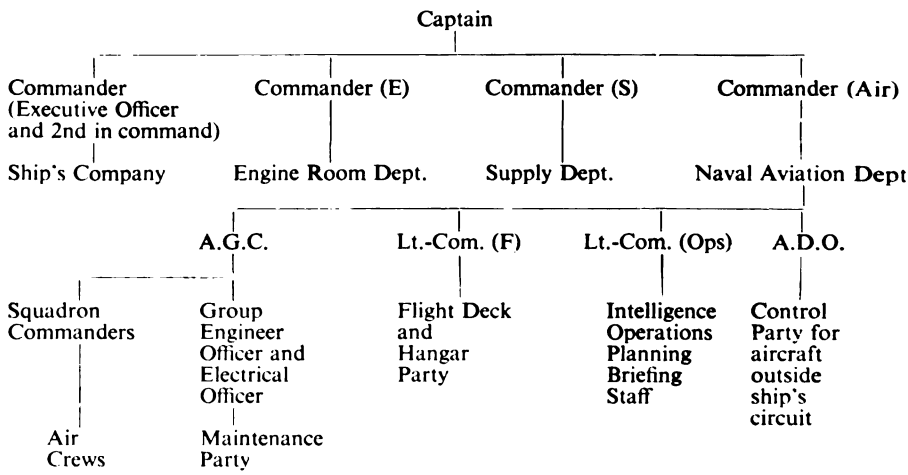
cruises. It stands to reason that every moment that a ship is at sea must be usefully employed. It is a very expensive business to keep a carrier manœuvering at high speed, so in the present state of fuel economy and financial stringency whenever one moves, full advantage must be taken to get in as much training, experience and experiment as possible. Everyone in the Navy realizes this, particularly that part who are employed in naval aviation.

The interest in developing a new branch of the Service is a thing that gives great satisfaction to all concerned. The progress in technique and types of aircraft is continuous and carefully regulated. That is why such a high standard of efficiency and keenness is prevalent throughout the air branch of the Service. Further, the part which will have to be played by the Air in any future naval war is outstanding. It may well be that our power to control the sea communications of the Empire may depend principally on the efficiency of naval aviation.

The recent part played by our aircraft carriers in the operations in Korea is an outstanding example of what "striking power" could be at hand at a moment's notice. There can be no doubt about it that life in an aircraft carrier, with its hard work and careful training, was fully proved worth while by what the complements of these ships achieved in the operations in that area.

Life in an aircraft carrier is a most interesting, exciting and worth-while job. Dull routine is not for those who serve therein, as the foregoing remarks will no doubt make quite plain.

ORGANIZATION OF AN AIRCRAFT CARRIER



A.G.C. = Air Group Commander.
A.D.O. = Air Direction Officer.

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V.Cs. OF THE AIR

WING COMMANDER HUGHIE IDWAL EDWARDS, V.C., D.S.O., O.B.E., D.F.C.

By Kenneth Hare-Scott

HUGHIE IDWAL EDWARDS was born at Fremantle, Western Australia, three days before the outbreak of the First World War. His parents had lived in Australia since leaving Wales in 1910; his father was an engineer, and there seemed no good reason to suppose that Hughie and his two brothers and two sisters would not, in time, live out their lives in Australia.

Completing his schooling in Perth, Edwards entered that uncertain decade of the 1930's as member of a shipping firm. A dual depression assailed him—that of sitting in an office and the financial strain of the period—and, for a change of atmosphere, he joined the Australian Army as a private early in 1934. Feeling that soldiering on a continent which seemed remote from the world's troubles offered little future, a year later he transferred as a cadet to the R.A.A.F., as a result of selection throughout the Commonwealth.

Passing through Point Cook Cadet College, where he was captain of cricket and football, he emerged a Pilot Officer now fully confident that he had found his vocation in life. Soon the international situation began to show the first of a succession of strains which ultimately led us all to war. Unprovoked aggression upon Abyssinia caused governments to look more closely to the needs of war. If rearmament was unpopular, there was no reason why the scanty man power available to the Services should not be the best in quality and training. Certain was this to apply to the Air Forces of the Empire, where some expansion was already taking place. Edwards learned that the R.A.F. annually accepted a limited number of fully trained cadets from the R.A.A.F., and just before completing his training he applied for, and eventually received, transfer as a Pilot Officer. He came to Britain with seven others in August, 1936.

A month later he was at the Flying Training School at Tern Hill, in Shropshire, trying to forget about the Wapitis which he had flown in Australia, and learning instead to handle the latest British types of bomber in advanced training. His first appointment was to 15 Bomber Squadron at Abingdon, and in March, 1937, he became Squadron Adjutant to 90 Squadron, flying Blenheims at Bicester. He has told me how happy he was to be in England at this time. Life had taken just the twist he wanted, and I should imagine that he derived full satisfaction in finding himself in the company of the best of youthful adventurers in whom ambition ran free—ambition to make the R.A.F. the greatest Air Force in the world. And it was this ambition which gave a sense of responsibility to balance the normal, healthy exuberance of youth in an age which thirsted for speed, and ever more speed.

In August, 1938, as with Hugh Malcolm, so with Hughie Edwards, a bad crash nearly ended his flying career. He was badly injured in leg and head, spent nine months in hospital, and, in all, two years off flying duties. It was a miserable period when he could never be quite sure that the high standard of physical fitness required by the R.A.F. would again be his.

In the summer of 1940 he was sent on a Specialist Armament Course, and later joined an Operational Training Unit at Bicester. He was back on Blenheims again; another crash, this time with lighter consequences, set him back a little, but by February, 1941, he was flying in day bombing operations with 139 Squadron. At last he had left the starting post, and his brilliant war career

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[*Photo: Fayer Camera Portraits, London*

*Wing Commander H. I. Edwards, V.C., D.S.O., **O.B.E., D.F.C.***

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was to unfold as lap by lap he added new lustre to the Service of his choice.

Casualties were high, and his promotion to Wing Commander was rapid. By May, 1941, he was commanding 105 Squadron in operations against coastal shipping. In June he won the D.F.C., and a month later, with attention now turned to heavily defended Germany, he was awarded the Victoria Cross for an action which in Britain and his native Australia won the highest praise; for 1941 was an anxious year for the Allies, and many months were to pass before the shape of things to come could be determined. We needed the tonic of such deeds of valour as Edwards and others were then performing.

The citation which described his V.C. exploit is best preserved in its wording:

"Wing Commander Edwards, although handicapped by a physical disability resulting from a flying accident, has repeatedly displayed gallantry of the highest order in pressing home bombing attacks from very low heights against strongly defended objectives.

"On 4th July, 1941, he led an important attack on the port of Bremen, one of the most heavily defended towns in Germany. This attack had to be made in daylight and there were no clouds to afford concealment. During the approach to the German coast several enemy ships were sighted, and Wing Commander Edwards knew that his aircraft would be reported and that the defences would be in a state of readiness.

"Undaunted by this misfortune he brought his formation fifty miles overland to the target, flying at a height of little more than fifty feet, passing under high-tension cables carrying away telegraph wires and finally passing through a formidable balloon barrage.

"On reaching Bremen he met with a hail of fire, all his aircraft being hit and four of them being destroyed. Nevertheless, he made a most successful attack, and then with the greatest skill and coolness withdrew the surviving aircraft without further loss.

"Throughout the execution of this operation, which he had planned personally with full knowledge of the risks entailed, Wing Commander Edwards displayed the highest possible standard of gallantry and determination."

Later in that July Edwards took his squadron to Malta to operate against shipping which carried Axis reinforcements from Italy to Tripoli and Benghazi. In September he was home again, and in October he accompanied Tucker, Malan, Broadhurst, Boothman and Whitworth on a good will mission to the U.S.A. Pearl Harbour had happened; America was in the war, and the hand of comradeship in arms stretched eagerly across the Atlantic. Edwards talked about the work of his day bombers; each hero spoke of his own branch of the Service, and they received a great welcome.

In January, 1942, he became Chief Flying Instructor at an Operational Training Unit, this time on night bombers. In the same month he married the charming lady with whom I met him recently—they have a small son now nearly eight years old—and for a while he remained at one station but, as he put it, "so hard worked that I got carbuncles and asked to be returned to ops for a change!"

In July he got his wish, and again took over command of 105 Squadron, now equipped with Mosquitoes and engaged upon low-level day bombing. The squadron became a pioneer in this novel form of attack which the enemy found demoralizing and destructive and the squadron, dangerous, for losses were high, but not out of proportion to the great achievement of the R.A.F. in being able to maintain a twenty-four-hour offensive against the Nazi wherever he was to be found. In December the ribbon of the D.S.O. appeared between the V.C. and D.F.C. on the Wing Commander's tunic.

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In 1943—at 28—he was promoted Group Captain and received a night bomber station in No. 1 Group. Promotion had certainly come rapidly, and he was now one of the old young men of the R.A.F., rich in experience, mature beyond his years, and, more remarkable, in tune physically for further action whenever opportunity presented itself.

A very good excuse came in May, 1943, when Australians came to his station and he felt it right and proper that he should accompany his countrymen on some of their night bombing raids. Lancasters were the aircraft, and Germany was, of course the target during the peak period of night bombardment. He found the Australians "good war prosecutors, and not very difficult to handle—although they were far away from home—and home was in great danger of Jap invasion." Knowing their temperament and feelings all too well, he was the best leader those brave but worried men could have had at such a time—and they responded magnificently.

The end of the year 1944 took him to Ceylon with a staff appointment as Group Captain, Bomber Operations. In 1945 he became Senior Air Staff Officer at Allied Headquarters, Kuala Lumpur, in Malaya, for three months before taking up a similar post with the Netherlands East Indies Forces at Batavia. In August, 1946, he dropped rank in the inevitable post-war reshuffle, and completed his Far East tour with another ten months as Wing Commander in charge of the R.A.F. at Kuala Lumpur. He received the O.B.E. in recognition of his work in the Near East.

Thus, more than six years of active service had, as I am sure he would put it, been his "privilege." His earlier injuries could at any time have placed him honourably upon terra firma, but that was not the spirit of the R.A.F. in those years. So long as nerves remained under control, and a clear brain reacted faithfully, there seemed no limit to what some were able to accomplish by indominable will power. Hughie Edwards, however, confesses that when finally in June, 1947, he came home, he was very tired indeed and, glancing back at these pages, I am not surprised.

After six months at the Staff College he served two years as Senior Personnel Staff Officer in No. 21 Group, Flying Training Command. Then followed a period flying Mosquitoes at an Advanced Flying School before taking up his present appointment as Senior Instructor on the Leadership Course organized by F.T.C. at Digby, in Lincolnshire. The modern R.A.F. would be hard pressed to find a more inspiring instructor in an aspect of flying training which must have been his own greatest personal quality—leadership.

So much for the man's achievements. In character and outlook he impresses me as a most normal person, with perhaps a little more than average interest in world affairs, people, and conditions. We last met when he and his wife had just seen their young son off to school for his first term, an experience quite as upsetting to the parents as to the boy himself. And they made no bones about it. We talked about schools, then Western Union (or, as Mr. Churchill prefers it, "United Europe" -less like a cable company!), Korea, Germany, and other things—which brought me no nearer to filling the gaps in my first draft of this article. It would have been very easy to have forgotten that my companion was anything other than one who took a lively interest in affairs generally, was well read, and at that particular moment, a husband and father. Such is the stuff of real heroes. Were it not for our habit of placing letters after people's names to honour their deeds and accomplishments, I fear that, by their deportment, we should fail often to associate the man with his deeds. That is how many of them would wish it to be.

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UNITY OF COMMAND

BY "AQUILA"

"NOTHING is more important than unity of command . . . one army . . . one line . . . one commander," said Napoleon as he eyed the surrealist tableaux entitled "Diagram of Inter-Service Command and Control." "Of course, it's 150 years since I had anything to do with war, but I am reminded of another of my maxims: 'The effect of discussions . . . and councils of war will be what the effect of these things have been in every age; they will end in the adoption of the most pusillanimous or (if the expression be preferred) the most prudent measures, which in war are almost uniformly the worst than can be adopted. True wisdom, so far as a commander is concerned, consists in energetic determination.' I would say it has stood the test of time!"

Unity of command is the basis of physical, mental and moral unity in battle. Has it been submerged by compromise in the complexity of war today? Certainly tradition has left us with a hotch-potch of divided responsibility and organization for operations by land, sea and air. Is it not becoming glaringly obvious that whatever administrative and training purposes may be served by a three Service system, operations of war can no longer tolerate the attendant paraphernalia of unco-ordinated doctrine, discipline and loyalty which can do nothing to cement and a good deal to undermine unity of action at the critical moment in the face of the enemy? It is time to shake ourselves free of notions withering all too slowly in the fierce light of progress, but not from the enduring principles of human conduct and war.

Let us investigate the source of separatist notions and the reasons for unity.

Man is a terrestrial being, not arboreal, aquatic or aerial. Our living space and livelihood are on land. The fruit of the soil is our daily bread; the earth yields its substance for us to fashion by industry to our comfort and wealth. We move and carry by sea and air, and more than ever by sea in this highly mechanized era.

In war we must secure the land areas and communications on which we depend. We must control the approaches to these vital interests, whether by air, land or sea. Our power to do this and to exploit the elements constitutes the conventional notions of land, sea and air power: "Land, sea and air power is, in each respective instance, the sum total of all weapons, installations, and geographical and other circumstances—all possible factors—which enable a nation to control and exploit the element described; namely, the land, sea or air."

The operations to establish our power in each element involve various components according to the geographical position and threat. Land power involves men, guns, tanks and aircraft depots, industry and supply. Sea power involves men, ships, aircraft and submarines, naval and air bases, industry and supply. Air power involves men, aircraft and anti-aircraft weapons, air bases, industry and supply. In fact, any comprehensive conception of land, sea or air power each implicitly stipulates varying patterns of dependence on the other.

Our main base, sea and air communications and our sources of supply are all exposed to the air. Strategically, it is the common denominator. Experience has shown that the effective use of weapons by sea, land and air, depend on freedom from undue interference. In all operations this is the key to the initiative. The tactical use of air forces in the defensive or offensive defensive by land, sea and

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air, and beyond the land and sea theatres of war becomes increasingly the main power behind the control of the land and sea as well as the air.

The system of joint command has been applied in air/sea, air/land and air/land/sea operations. It may be difficult to see how any other system could reconcile the need for flexibility in the manifold combinations of war and its wide variety of geographical and time and space factors, with the need for unity of command.

If the ideal of unified command cannot be achieved in all operations today, at least we can seek to achieve it at the most critical time, place and challenge. What is, therefore, the swiftest and most mortal danger to our survival? Because if we can identify it, there is the battle in which we should do our utmost to ensure undivided command!

Our war potential is organic. A breakdown in one sphere leads ultimately to a breakdown in all. The difference lies in the degree and nature of the threat to which each is exposed, the intensity of the defensive effort required, the innate vulnerability of particular facets, and the relative time in which enemy action may become decisive.

I say that the most critical battle in modern war is the defence of the main base against all the innovations and weapons which can be hurled from the air Operationally, the loss of this air battle means the loss of our ability to use our weapons by land, sea or air with any hope of success. Strategically it will open the way to invasion and the paralysis of our sea communications—in short, defeat.

The preponderating influence of controlling the air in strategy, operations and every tactical combination makes it the primary aim in all operations of war. The whole galaxy of ulterior operations can only derive their efficacy from the maintenance of air ascendancy.

Therefore, the security of our base and communications, and the efficacy of all our operations can and should be enhanced by establishing the unified command of all operational forces which could possibly contribute to our ascendancy in the air and the incomparably critical battle in defence of our base, living space and homeland.

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THE AIR FORCES IN PARLIAMENT

STRENGTHENING DEFENCE

THE debates on defence (three days in the House of Commons and two days in the House of Lords) ranged freely over the whole field of naval, military and air defences. While the Opposition in both Houses supported the Government's measures, they expressed their conviction that these measures, or some like them, ought to have been taken a year or so ago, and they questioned whether the measures proposed were now sufficient, in view of the increasing danger in Europe and Asia.

Many old topics were inevitably raised in both Houses, as there have been numerous defence debates during the past few years. The problem is not a new one, but it is becoming increasingly insistent. Among the questions that call for immediate answers are the following: (i) Should Western Germany be re-armed; and if so should she have her own self-contained army with its own staff and administrative services and industrial backing, or should she provide contingents, with no formation higher than a division, for service in the forces of Western Europe? (ii) How should the forces of Western Union be organized? Are they to consist of national contingents each responsible to its own national government or are they to be completely integrated under a European Defence Minister? And (iii) is it not time for a supreme commander to be appointed to command the forces of Western Union if and when a war breaks out in Europe?

The strongest objections to the re-arming of Germany come from France, and, strangely enough, from Western Germany itself. One can well understand France's objections. Three times in seventy years has a German army marched into France and what guarantee is there that it will not happen again? France does, however, realize that the immediate danger is not from Germany but from Russia, and she is prepared to concede the re-arming of Germans to serve as a national contingent in the forces of Western Union. This is very different from re-creating the Germany Army. As for the objection by the Western Germans themselves, it was clearly voiced by the Federal Chancellor, Dr. Adenauer, who, like the French, fears the power which it would again put into the hands of the military and nationalist classes in Germany.

Those are the French and German points of view. But there is another aspect; the strategical one. As has been repeatedly said in Parliament and in this Journal, Western Union must be defended on the Elbe and not on the Rhine. And if the Elbe is the line of defence, Western Germany is part of the area defended and the Western Germans should help to defend themselves and their land. Furthermore, the French Army being still far below its natural strength, even with the addition of forces proportionate to the population of Western Germany, Western Union would still have far fewer troops than Russia and her satellites could muster for the invasion of Western Europe. It would therefore appear that Western Germany must be re-armed; and to satisfy the French and Dr. Adenauer, Western German divisions should form separate national contingents in the forces of the Western Union powers.

The suggestion that the forces of Western Union should be organized under a European Defence Minister, whilst satisfying the French and being perhaps a tidier scheme than national armies under a supreme commander, seems to have little else to recommend it. A European Defence Minister implies a European Government and this we have not got nor are likely to get within a measurable time—certainly not before the balance of power has again been completely

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altered. Although a force consisting of national armies operating under a supreme commander, whilst still responsible to and maintained by their own national governments, seems a very untidy and clumsy organization, it has worked tolerably well during both world wars, and both times it succeeded in beating the undivided forces of a State that had all the advantages of a single government and of interior lines. So, for strategic reasons, and because the alternative is not possible at present, we should be content with separate national armies under a supreme commander.

It is time that the supreme commander was nominated. Presumably he would not command until the outbreak of war; but there is a limit to what planning staffs can do in the absence of the man who is to take command, and that limit has been reached. Who is the supreme commander to be? General Eisenhower's name has been suggested in various quarters, and we understand that he has gallantly placed himself at the disposal of his Government for employment in that capacity if required. His early appointment would inspire confidence in all the forces concerned, ensure adequate planning in advance, reduce to a minimum the inevitable friction between the commanders-in-chief of different national armies, and be a guarantee of rapid and complete victory.

As usual, in the House of Lords, Viscount Trenchard threw the weight of his vast experience and undaunted personality into the defence debate. He, like Mr. Churchill in the House of Commons, was all for re-arming the Germans and for holding the line of the Elbe. He also again called, and again unsuccessfully, for specific information about our air strength. The Government are, no doubt, actuated by motives of security when they withhold such information from Parliament and the Press; and that being so it is not for this Journal to criticize or to complain. But the suspicion cannot be eliminated that the Kremlin already knows more than we do; and if not, are we not going to disclose our strength until it is too late to act as a deterrent? Whether we are told or not, the needs remain. "Without adequate air superiority," Lord Trenchard said, "everything else is useless." We are to have extra bombers and extra fighters. Lord Trenchard called for "a hundred squadrons of bombers and of fighters." But is Coastal Command to be brought up to strength? We do not know.

And what of Transport Command? Air lifts will be a feature of any future world war. Troops in large numbers will have to be moved and supplied by air and that will be the most important of Transport Command's jobs. Is it not time that plans for its expansion were made? And, as has been said before, numerous air bases will be required all over the world, properly equipped and supplied and capable of taking any type of aircraft that may need to use them. It will be too late, when war breaks out, to begin to equip these air bases. They must be selected, equipped and supplied beforehand. The importance also of a tactical air force, trained in peace time to play its part in preparing the way for and supporting the army in an offensive, or in harassing the enemy's advancing troops and his lines of communication when we are on the defensive, must not be overlooked. The fighting in Korea confirmed former judgments of the value of a tactical air force in support of land forces; but it must be adequately trained and equipped before a war breaks out, otherwise it may be too late. During the last war it look a long time to build up the technique of close support from the air to the ground, and it demands a very high standard of training. For examples of what air support can do in the attack, one may study the Battle of El Alamein; and to prove its value in defence, there are Anzio and the Battle of the Bulge where the tactical air force, by successfully smothering the enemy's offensive, contributed considerably to the success of these operations.

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Attention was also called in the House of Lords to the paramount need for security in the sense of safeguards against the betrayal of State secrets to foreign governments, e.g., that of atomic power by Dr. Fuchs, and against sabotage, e.g., the Portsmouth ammunition explosion. This cannot be too strongly emphasized and all who are responsible for security at R.A.F. Stations, at Headquarters of Formations, and at the Air Ministry will doubtless redouble their efforts. We as a nation are so considerate of the individual, be he British-born or naturalized, and so very loath to interfere with his freedom in any way, that we lay ourselves open to such abuses of our good nature; but if we do not want all our sacrifices to be in vain, we shall have to be more careful to whom we entrust our secrets and whom we admit to our naval, military and air force establishments.

By way of conclusion, and in view of the anxiety expressed by many members of both Houses as to our preparedness for war, it is interesting to note that, according to Viscount Alexander of Hillsborough, we have more Regulars in the three Services today than there were, outside India, in 1939. Let readers extract what comfort they can from that statement. But what does it amount to? It is pleasant to know that we have more troops available for service anywhere except India than we had in 1939. But that is satisfactory only if the present danger is no greater than the danger in 1939; and, even so, we were seriously unprepared in 1939, and had it not been for the "phoney" war that lasted several months we should have had our Dunkirk much sooner. And why exclude India? Granted that we no longer have to maintain a garrison there, who can doubt that, if the Russians decided to advance on India, we should have to send a pretty strong British force of all arms to help Pakistan to resist the aggression. So our liability for India remains but it takes a different form.

Another attempt at comfort the noble Lord made when he said, quoting Lord Layton, that never before in our history in peace time have there been such alliances or associations or such integration as are provided by the North Atlantic Treaty Organization. But there again the statement is inconclusive. The only proper test of our military preparedness and of the value of alliances and agreements is their effectiveness in the present circumstances of danger. Are they or are they not adequate? General Marshall, as we have seen, says there is a dangerous gap between what we have in Western Europe and what we ought to have. So long as that gap remains, no Western nation can rest satisfied with its position.

We may, however, agree with the Lord Chancellor, who pointed out that our delay in taking appropriate action to combat the Communist menace is a phenomenon common to all really democratic nations. They are slow to make decisions, particularly decisions involving greatly increased expenditure on armaments and the diversion of youths from industry to the armed forces. And our defence programme—in peace time, at least—is inseparably bound up with our financial position. "No country in the world," said Lord Jowitt, "has been spending a larger proportion of its budget—or of its national income—on defence than this country." But all this has to be paid for out of revenue or by reducing expenditure on other things. No one proposes we should "slash the social services." They must continue unabated, but their natural development may have to be slowed up or postponed.

It will, of course, be some time before the effects of these measures for the strengthening of defence will become apparent on R.A.F. Stations—except that the National Service men are staying on for an extra six months. But we may be satisfied that something at least is being done to prepare the R.A.F. for the vital task they may, in the near future, be called upon to undertake.

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CURRENT EVENTS

UNITED KINGDOM

Jet Bombers in 1951 Air Exercises

AT the opening of the Exercise "Emperor" last October, Air Marshal Sir Hugh P. Lloyd, Commander-in-Chief, Bomber Command, said: "This year we are employing jet fighters to simulate jet bombers. This is necessary to fill the gap until we are ready to operate our Canberras. It will probably be a different story next year."

Bomber Command squadrons are expected to take delivery of their twin-engined English Electric Canberras (jet bombers) early in the New Year. This will open up a completely new era in bomber development. One of them already on order is a longer-range four-jet aircraft with performance similar to the Canberra. Even more advanced types are known to be under development.

The jet fighters simulating bombers in the recent air exercises were intercepted *en route* from Germany to their targets in this country. Gloucester Meteors and Vampire fighters caught these "stand-in jet bombers" at heights between 28,000 and 38,000 feet. These were the highest interceptions ever made by fighters in air exercises over this country.

S.B.A.C. Display in 1951

Uninformed statements in a section of the London Press appear to have created in some places overseas an impression that the Society's Display last September will be the last—at least for several years. Preparatory work in the Society's offices for a display in September, 1951, has already been put in train as the routine of the organization.

The actual decision whether a display will then take place is to be made by the Council of the Society in January or February. They will undoubtedly bear in mind that more visitors from overseas attended the 1950 display and more business was done than ever before. Moreover, the Society's "best and biggest" display might well provide a fitting and spectacular climax to the Festival of Britain.

High-Speed Heat

Modern jet fighters have become so hot when flying at high speeds that designers are faced with the problem of cooling them off. Cabin temperature rises not only with the heat of the jet engines: it also rises with the effects of the skin friction between the air and the fuselage of the planes. Pilots often find their cabins uncomfortably hot, especially when flying in the tropics. The Royal Air Force have countered the problem by ordering a small refrigeration unit for cooling the cabins of their high-speed fighters. The unit, which weighs only 9½ lb., works quite simply. It compresses hot air from the engine and then lets it expand so that it cools below the freezing point. This cool air then flows into the cockpit at a rate of something like 10 lb. per minute.

Flying Classrooms for R.A.F. Air-Crew Training

Now in production for the Royal Air Force is the Vickers-Armstrong Valetta T.3, a "Flying Classroom" to carry ten pupils and two instructors, for the training of aircrews. It carries in addition a crew of four. One of the largest

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twin-engined training aircraft ever built, it will be used for advanced navigational training, involving the use of the latest radio and radar aids to navigation.

Built in along the top of the fuselage are six "Astrodromes" from which pupils will take astronomical readings. Inside the classroom will be up-to-date navigational aids which are replacing the dead-reckoning methods standard with R.A.F. navigators for many years. Performance details of this aircraft are still secret.

By Comet to Berlin

Last autumn a de Havilland Comet jet air liner gave a convincing demonstration of the value of high speed air transport. Leaving Hatfield at 9.24 a.m. with a crew of five and fifteen passengers it landed at Gatow, on the outskirts of Berlin at 10.53 a.m., having covered 570 miles in one hour twenty-nine minutes. After spending five and a half hours on official duty in Berlin the passengers were home again in time for an early dinner, having in the day flown over eleven hundred miles and completed in the spare time in hand a good deal of government business. The normal air-liner time from London to Berlin is four hours eleven minutes.

Result of 1950 Lawrence Minot Trophy

No. 617 Squadron (R.A.F.) Bomber Command won the final of the Lawrence Minot bombing competition at Wainfleet Range, Lincoln, and were duly presented with the trophy by H.M. The King at Buckingham Palace last November. The runners-up were No. 214 Squadron. The result of the bombing was taken over an average of four bombs dropped from each squadron at 10,000 feet. It was this squadron, only formed in March, 1943, which breached the Mohne and Eder dams in May of that year. In 1944, in conjunction with No. 9 Squadron, they sank the German battleship *Tirpitz*.

Gordon Shephard Memorial Prize Essay Competition

In 1950, forty-three entries, mostly from officers of the Royal Air Force, but including some airmen, were received for the Gordon Shephard Memorial Prize Essay Competition.

The subject set for the essay was: "The effectiveness and striking power of an Air Force is directly related to the degree of efficiency achieved in the use of its men, equipment and training time. Discuss this theme and suggest any means by which, in your view, the efficiency and striking power of the Royal Air Force can be increased without increasing its proportionate call on National resources."

Prize-winners were: 1st prize (£50), Wing Commander A. G. T. James, O.B.E.; 2nd prize (£30), Acting Squadron Leader C. T. Nance, M.A., A.F.R.Ae.S., A.M.I.Mech.E.; 3rd prize (£20), Squadron Leader C. M. Clementi, O.B.E.

For the 1950-51 competition the subject will be: "The rapidly increasing speeds and ranges of aircraft mean that, in a future war, air forces of two or more nations may have to operate in close co-operation, not only strategically, but tactically, from bases separated possibly by thousands of miles. Command, strategy, tactics, mobility, communications, equipment, training and many other problems are involved. How should an air force be developed and trained to meet these problems successfully?"

Essays will be limited to 10,000 words. The prizes offered will again be £50, £30 and £20.

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[Air Ministry photo

KOREA

The Royal Air Force Sunderland "C" for Charlie of No. 88 Squadron has been carrying out daylight reconnaissances of Korea's Yellow Sea coast. The captain is Flying Officer R. S. Brand, of Edgbaston, Birmingham, his co-pilot Flying Officer G. S. Boston, of Leyton, London, the Engineer II G. R. Lee, of Bishopsthorpe, York, the Signaller II G. H. Price, of Sale, Cheshire, the Navigator II G. A. H. Ashbrook, of Hoole, Chester, the Gunner II J. M. Reilly, of Middlesbrough, and Master Signaller T. Brown, of Leigh, Lancs.

While the Sunderland flies low over grey skies, her crew scan the horizon for blockade runners. Pilots and gunners keep an uninterrupted lookout while the aircraft's radar scans a much wider sweep of sea.

The flying boat carries only one gunner, but two signallers and two engineers. The signallers and engineers take time off from their radio sets and gauges alternately to man the guns.

Our picture shows "C" for Charlie in the lee of its operation control ship, beginning its take-off run over the smooth waters of the Iwakuni roads.

In the picture above is Air Marshal Sir Francis Fogarty, C.B., D.F.C., A.F.C., Commander-in-Chief, Far Eastern Force, chatting with Wing Commander D. H. Burnside, D.S.O., D.F.C., Far East Flying Boat Wing's C.O., while senior United States naval officers look on. In the centre of the picture is Group Captain Charlton, R.A.A.F., Station Commander at Iwakuni.

NEW ZEALAND

On a very wet morning the Hastings I carrying the R.A.F. Flying College team on a liaison visit to the R.N.Z.A.F. stations touched down at Whenuapai, near Auckland. In the picture, Group Captain M. F. Calder, C.B.E., the Commanding Officer, is seen receiving the party; with him is Squadron Leader G. S. A. Stevenson, D.F.C., Officer Commanding, Administrative Wing, Whenuapai. Reading from the left: Group Captain C. G. Lott, C.B.E., D.S.O., D.F.C., R.A.F., leader of the mission; Group Captain Calder; Squadron Leader Stevenson (partly obscured); Wing Commander C. D. Milne, D.F.C., of R.A.F. Training Command; Squadron Leader G. C. Atherton, of Central Fighter

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In the lee of its operation control ship, "C" for Charlie begins its take-off run over the smooth waters of the Iwakuni Roads

[R.N.Z.A.F. photo

The R.A.F. Flying College team visits the R.N.Z.A.F.

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Establishment; Wing Commander S. P. Coulson, D.S.O., D.F.C., of the Flying College; Flying Officer G. Bentley, R.N.Z.A.F., Public Relations Officer.

MIDDLE EAST

R.A.F. Memorial in Nairobi

A memorial to members of the Royal Air Force and of Commonwealth Air Forces who died in the service of their countries during the Second World War was dedicated at a special service held recently in All Saints' Cathedral, Nairobi. The cost of the memorial was raised by public subscription in Kenya.

The memorial, which takes the form of an altar set in silver comprising a cross, two vases and two candlesticks, was formally presented to the provost, the Very Reverend H. A. Hopkins, by the Air Officer Commanding, East Africa, Air Commodore L. T. Pankhurst, C.B.E. At the same time, Air Commodore Pankhurst presented the cathedral with a pew made by the R.A.F. craftsmen in East Africa.

Later in the service, which was attended by the Acting Governor, Mr. J. D. Rankine, and other leading personalities in the colony, a wreath was laid on the altar by the Vice-President of the R.A.F. Association in Kenya, Squadron Leader C. A. Hooper.

FAR EAST

Badge Presented to R.A.F. Station, Changi

Presenting the new station badge to R.A.F. Station, Changi, Singapore, at a ceremonial parade held there recently, Air Vice-Marshal Sir Francis Mellersh, Air Officer Commanding, Malaya, said the station had many demands made upon it, all of which it met with willing efficiency.

In the campaign against the bandits in Malaya, he said, the station was servicing all the Dakotas which dropped supplies to the ground forces. A fresh commitment, taken in the station's stride, had been the extension of Transport Command's trunk routes to ferry British troops to Korea.

The badge, received by the Station Commander, Group Captain J. L. F. Fuller-Good, depicts a starfish, symbolising the station's proximity to the sea, the five legs of the starfish also representing the five principal R.A.F. formations housed at the station. Beneath the badge is the motto, in Malayan, "Kami Melindongi Semua," meaning "We shelter many."

No. 22 GROUP MODEL AIRCRAFT FIELD DAY

Corporal Barker with his "Super Slicker," winner of the ***Power Precision Contest*** *at No. 22 Group Model Aircraft Field Day, held at R.A.F., Tern Hill, 1950*

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SPORT IN NORWAY

(Why not spend your holidays in Norway?)

BY MAJOR O. T. MEHN-ANDERSEN, D.F.C.

THE author of this article has read with great interest accounts in the QUARTERLY of the activities of the R.A.F. Mountaineering and Winter Sports Associations. But, being a Norwegian, he naturally asked himself: "Why do they not try Norway?" The obvious answer must be unawareness of what Norway has to offer in these particular fields and exaggerated opinions as to the costs of travelling to and living in Norway. Once these facts had been established the author set himself the task of pointing out, with patriotic zeal and fervour, what those possibilities are and the expenses involved. But first he would like to say some words about climbing and ski-ing in general.

There are several reasons why mountaineering, and ski-ing in particular, should appeal to Air Force members. In the January, 1949, number of the QUARTERLY, Group Captain T. F. U. Lang had this to say about the similarities between ski-ing and flying: "Even the feeling of speed when ski-ing downhill on perfect snow under complete control is almost as sensational as flying the fastest jet aircraft." Some of those "in the know" may consider this an understatement. The sensation of speed derived from diving a Meteor or Vampire at the modest speed of about 600 m.p.h. has little in common with the terrific and breath-taking feeling of acceleration one gets from ski-ing down a steep mountain-side at 40 to 50 m.p.h.

Similarly, the sensation of height derived from stooging around in an aircraft at a mere forty or fifty thousand feet bears but little resemblance to the very real feeling of elevation experienced when dangling at the end of a rope or hanging on for dear life to a diminutive protrusion on the face of a cliff, overhanging a valley 3,000 feet below.

By a little stretching of the imagination the comparison between flying and mountaineering may be carried much farther. The conquest of an almost inaccessible mountain-peak has very much in common with the successful accomplishment of a war-time operational sortie, requiring a similar kind of skill, courage and determination. Firstly, there is the planning or "briefing" stage, full of eager anticipation and not entirely without some apprehension. Everyone is busily trying to collect and sort out "all the latest gen," weather reports are carefully studied, maps and photographs are scanned, different routes are contemplated, the best approach to the "target" eagerly discussed, and the equipment—on which so much depends—is being meticulously checked. Secondly, the crowning triumph and deep satisfaction when the "target" has been reached and the purpose of the "mission" accomplished. Thirdly, the long trek home, not by any means void of danger, but carried out in high spirits because the most formidable obstacles have already been successfully overcome. And, finally, the blessed exhaustion and pride of achievement after having "returned to base," when there can no longer be any doubt that the task has been well done, thanks to good planning, careful preparation and excellent teamwork by each and every member of the "crew."

This somewhat lengthy introduction leads up to the real purpose of this article, to do some propaganda for the good old country and point out what Norway has to offer, not only to the ski-ing and mountaineering enthusiasts but also to other members of the R.A.F. and W.R.A.F. in search of a healthy and invigorating holiday.

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SKI-ING

A ski-ing paradise in ample and warm sunshine, where glistening snowfields extend far into the distant horizon

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SKI-ING

Ski-ing is Norway's favourite winter sport and a sport for which the country is ideally suited. In most parts of Norway the snow lies unfailingly from before Christmas until the end of April, and the snow conditions are reliable and fairly constant from year to year. February and March is the best season, but—contrary to general belief—one may enjoy fine ski-ing in ample and warm sunshine even in January.

Neither will it be necessary to travel very far in search of good ski-ing country. The people of Oslo have it practically at their door-step. On Sunday mornings, all through the winter and early spring, one may observe a long queue of people of both sexes, old and young and complete families, lined up for several blocks outside the capital's main underground station, undistinguishable from a Saturday football crowd in London, except for the fact that they all carry skis and are dressed in colourful winter sportswear. A twenty minutes' train ride will take them to Nordmarka, a skier's paradise of forests and hills stretching for nearly one hundred miles to the north of the capital.

But ski-ing under a scorching sun high up in the wide expanses of the open mountain-plateaux, where the air is thin, cool, dry, and invigorating, and where the glistening snowfields extend far into the distant horizon, is an entirely different sensation, a matchless and elated feeling of freedom and exaltation, rarely if ever experienced in any other sphere of human activities. It has rightly been said that no one can harbour a mean thought while ski-ing in the mountains. The petty worries of everyday life seem to fade away into insignificance, and instead there is a feeling of contentedness, peace of mind, and oneness with nature which must be experienced in order to be truly appreciated. It may be said that a ski-ing holiday in the mountains can more aptly be described as "a way of life" or as "a state of mind" than as just another form of sporting activity. Not even in his native tongue could this author give an appropriate description of its peculiar thrill and satisfaction.

The favourite mountain ski-ing season for the Norwegians is the Easter holiday. Then the mountains virtually become alive with skiers. Judging by the complexions one sees on the street just after Easter time, some southern race might have replaced the local population. All shades of sunburned faces, from the almost black to the tender copper, are in evidence everywhere. It is equally obvious that all are proud of their new and very becoming complexion and strive to show it off to its best advantage. White shirts and collars have all of a sudden become the latest fashion.

Visitors to Norway will have the choice of ski-ing either in the "Continental" or in the "Norwegian" way. The Middle European countries go in for ski-lifts to a very large extent, and the skiers usually stick to the same run all day long. The Norwegians prefer cross-country ski-ing up and down valleys and across mountains and highland plateaux. They usually set out just after breakfast, either returning for lunch or taking a packed lunch with them, spending the whole day ski-ing and seeing different landscapes every day. The endless variety of terrain makes it possible to enjoy a fair mixture of practically every type of ski-ing, enough to suit all tastes.

There are several reasons for this preference of cross-country ski-ing. Firstly, practically all Norwegians possess a certain ski-ing proficiency, therefore the need for practising is not so great, and consequently ski-ing is considered more as a means to enjoy nice scenery and refreshing out-of-door life, than an end in itself. From the point of view of most Norwegians, being dragged up and ski-ing down the same hill all day long, together with numerous other people, is a rather

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dull activity, even if that particular hill should happen to offer some very good sport, and although this method admittedly affords the best possibilities of working up proficiency in the shortest time. Secondly, getting to the top of a hill "by one's own steam" is a good practice and a greater satisfaction, making one feel that one has better deserved the downhill run. Thirdly and finally, the Norwegian countryside is ideally suited to cross-country ski-ing, because of the large highland plateaux and because the mountains are usually not as steep and inaccessible as their counterparts in Central Europe.

Nevertheless, there are modern ski-lifts in operation at several large winter sports centres. Practising slopes of all grades of difficulty are legion, and authorized instructors are available for children and adults alike.

MOUNTAINEERING

Norway is predominantly a mountainous country with rugged and towering peaks rising to more than 8,000 feet and mighty glaciers covering hundreds of square miles. Although this type of country is rather unproductive when it comes to the question of national economy, it affords limitless opportunities for unexcelled mountaineering and hiking.

It was British climbers who were the first to "discover" the grand peaks of Norway. Beginning in the second half of the nineteenth century, hundreds of our mountains, even far beyond the Arctic Circle, were first conquered by climbing enthusiasts from the British Isles. From their accounts, future visitors can get some idea of what Norway holds in store for those who practise the noble art of climbing. Thus, in 1906, the veteran British mountaineer, William Cecil Slingsby, gave this description, in the *Alpine Journal*, of Kalken, a fearsome-looking mountain in the Trollheimen range south-west of the city of Trondheim: "The precipices of Kalken which rise to such enormous heights out of the grim canyon are of a sort rarely seen on this planet. In Norway there are but few real mountain-walls over a mile in vertical height; in the Alps there are none. There is an awful crack on the face of Kalken, a chimney nearly 6,000 feet in height. Had we been able to divide the height by twenty, it would still have been a remarkable chimney, and could we have reduced that terrible angle by twenty degrees, it would still have been steep and formidable." Even today this unearthly wall remains unconquered, and Norwegian experts believe that an ascent would entail spending a night on the face of the cliff, as the climb could probably not be completed in a single day.

Slingsby finished the account of his climbing in Trollheimen with these words: "It is quite certain that Trollheimen offers great attractions to the tourist who loves to go out of beaten tracks. Much detailed mountain exploring still remains to be undertaken there, in which the spice of adventure will certainly appear."

Slingsby's closing remark on Trollheimen holds good even today and also goes for numerous other mountain ranges throughout the whole length and width of the country. Countless walls and arêtes have not yet been climbed and some of them may prove unassailable even by expert cragsmen.

The best-known climbing centre is probably that of Turtagrö, at the foot of the Horungene mountain group in Southern Norway, offering rock climbs of the highest standard and a grand sport to novices and experts alike. All the popular rock climbs in this area are well cairned, thus presenting excellent opportunities for parties of some experience wishing to learn guideless climbing.

For those who like to blaze new trails there is still ample scope for further exploration, ranging from extremely exposed to moderately difficult climbing. Those with the spirit of adventure in their veins should take a tent and camping

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MOUNTAINEERING
***Rugged** and towering peaks in plenty; affording limitless opportunities for unexcelled mountaineering*

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FISHING IN NORWAY
Here is indeed a Fisherman's Paradise!

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equipment and travel to remote places in Northern Norway. Here they will come across a profusion of ragged ridges, fantastically shaped peaks and magnificent panoramas.

Although the mountains in Norway do not reach the same "absolute" height as the tallest peaks of Central Europe, the actual height to climb is at least equal to that of most of the celebrated peaks in the Alps, because the climbs usually commence practically at sea-level and consequently may take up to eighteen or twenty-four hours to accomplish. The great majority of the Norwegian mountains offer good rock climbing on perfect gabbro rock, comparable with that of the Isle of Skye. The ice and snow work encountered is generally easy and suitable for novices. The best period of climbing is from 15th July to 15th August.

HIKING AND OTHER MEANS OF LOCOMOTION

Those who enjoy mountain scenery and the invigorating and refreshing mountain air, but prefer a more gentle saunter to strenuous and breathtaking climbing, will find no difficulty in having their wishes fulfilled. Norway offers an endless variety of scenery leading through regions of unsurpassed beauty with a profusion of mountains, highlands and glaciers, fjords, rivers and waterfalls, easily accessible by normal methods of locomotion.

Hikers can either choose a good hotel as a starting point and return there after completion of the day's walking tour, or walk from mountain hut to mountain hut. Both alternatives are equally feasible. Even up in the mountains there are a large number of comfortable hotels to choose between, and the Norwegian Tourist Association has opened up vast mountain areas by building huts at convenient distances of about a day's walk from one another, and by marking valley paths and mountain trails by cairns which are placed at regular intervals so that anyone can follow the routes without difficulty. Most tourist huts open during the last week of June and close after first week of September.

Southern Norway offers virtually unlimited opportunities for hiking tours. In Northern Norway tents and sleeping-bags will have to be relied upon in the more remote areas, but here it will be possible to walk for days on end, undisturbed by other out-of-door enthusiasts. The added attraction of the midnight sun will give twenty-four hours of daylight. Even several hundred miles north of the Arctic Circle the vegetation is astonishingly rich, with large forests and rolling farmland, and—contrary to popular belief—the "Arctic" climate is often as hot as a typical summer's day in Surrey.

Those who really go in for relaxing on their holidays will be able to enjoy the scenery from a ship's deck or a motor-car. A voyage on a coastal steamer through one of the many scenic fjords, stretching for several hundred miles inland, is an experience which even the most fastidious connoisseurs of nature's beauty and grandeur will relish. Similarly, the roads connecting the western and eastern parts of the country, twisting and turning upwards to four or five thousand feet, are engineering feats and offer breathtaking views which must be seen to be believed.

OTHER OUT-OF-DOOR ACTIVITIES

Among the many other attractions Norway has to offer members of the R.A.F. and W.R.A.F. in search of a good holiday, it will suffice to mention fishing, shooting, sailing and swimming.

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BATHING

Of a variety to meet the desires of all, from the "jump-off-the-cliff" kind to "sandy beaches with diving-boards and high-diving towers," with pleasant restaurants and delightful company

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Fishing

Norway is honeycombed with myriads of lakes, actually more than one hundred thousand, and a corresponding number of rivers. There are more than a hundred salmon rivers, and trout is plentiful in most rivers and lakes. Northern Norway is especially well known for its salmon fishing. Thus a British visitor, out to try his luck in 1948 in the famous Alta river, caught thirty-nine salmon *in one day.*

The best salmon rivers are expensive, but salmon fishing free of charge may be had in private beats owned by certain hotels. A licence for trout fishing costs from 5s. to 25s. per person. The fishing season varies from district to district, but extends generally from early June until the end of September.

Shooting

The stock of big game, such as elk, wild reindeer, stag and roe deer, is now quite satisfactory, whereas small-game shooting is not quite as bright. The shooting season varies for the different type of game, but is mostly either in September or October.

Finally, it may be worth mentioning that although bear are now almost extinct, there still are some old "die-hards" roaming the forests and mountains free for all.

Sailing

The Norwegians have, as the British, from time immemorial been a seafaring nation. Norwegian waters are peculiarly suited to all types of yachting. The coast line, extending for more than 1,200 miles, is lined with about 20,000 islands, thus affording sheltered "leads" very nearly around the entire coast, making an ideal playground for those in favour of a holiday at sea. The main yachting events take place in and around the Oslo-fjord, where, on a nice summer's day, small craft of all types dot the wide expanse of the fjord as far as the eye can see. Boats of any description can be rented for long or short periods, with or without crews. Those who wish to sail in the daytime and spend the nights ashore will be able to choose between a large number of seaside hotels.

Bathing

Thanks to the Gulf Stream, the water is generally quite warm enough for bathing during the summer months even far north of the Arctic Circle. In the Oslo-fjord, the average day temperature of the water during June to August is 64 to 68 degrees Fahrenheit. The water is salty and clear. Most bathing is of the jump-off-the-cliff variety, but there are also many popular bathing resorts, with sand beaches, diving towers and restaurants.

The long hours of daylight add to the attraction of a summer holiday on the coast. Even as far south as Oslo it never gets really dark during midsummer.

CONCLUSION

Some people seem to be under the false impression that a holiday in Norway will necessarily involve very high expenses. The contrary is the truth. Norway is without comparison even now the cheapest holiday country in Europe. There are no longer any currency restrictions and British visitors will soon find out that in Norway the pound is still worth twenty shillings.

Admittedly, the travel expenses are probably somewhat more costly than a

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journey to some of the winter resort places on the Continent, amounting to £9 10s. each way by second-class steamer from Newcastle to Bergen or Oslo. But any travel agency in Britain will quote considerably reduced fares when booking an inclusive tour. Special concession air fares are also in force, and charter hire by aircraft for special trips will further reduce the travelling expenses.

In Norway the average cost of a good hotel room and three square meals a day is roughly eighteen to twenty shillings, but much more reasonable terms can be arranged in smaller hotels and in pensions and tourist huts. A still cheaper and, to the thinking of many people, much more pleasant arrangement, will be for a party to rent one of the many large and comfortable private huts, of which there are virtually an unlimited number in practically all parts of the country. Those who, like many Norwegians, really like to "rough it," incurring hardly any living expenses at all, should use tents in the summer and travel with dog teams in the winter, spending the nights in reindeer sleeping-bags, dug into a warm and cosy snow-bank.

Very little personal spending money is needed in Norway, and there are no *taxes de sejour*, etc. The emphasis is on the sporting side, and less on the cocktail side. Thus the chances of rubbing shoulders with famous film stars, Eastern potentates, "Grand Pooh-bahs and Hindu priests" are definitely not very great.

Finally, some words about the inhabitants of Norway. A visitor from Britain should have no difficulty in finding himself at home among the Norwegians. He will probably notice more people with blond hair and blue eyes than among his own countrymen, though—especially on the West Coast—he might easily come across people of a more British appearance. These are probably descendants from those selected maidens who—somewhat reluctantly—were made to accompany the good old vikings on the homeward journey from their yearly "visits" to Britain.

When it comes to the way of life, outlook and attitude of the Norwegians, our visitor from Britain will agree that it is not much different from his own. Furthermore, he will have little difficulty in making himself understood in the streets and in hotels and shops. Most Norwegians understand English, and quite a few speak it fairly fluently.

If our particular visitor should happen to be a member of the R.A.F., he will probably have even less difficulty in feeling at home in Norway, especially if by chance he should get in touch with one of the many Norwegian soldiers, sailors or airmen who spent several of the war years in the British Isles, and who have a large debt of gratitude to repay for the splendid hospitality they received there. Furthermore, he will soon understand that the people of Norway as a whole hold his Service in very high esteem, and know perfectly well that a large share of their thankfulness for Norway's liberation in 1945 must go to the Royal Air Force.

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A WINTER EXPEDITION

By Flight Lieutenant J. G. Parish (Meets Secretary, R.A.F.M.A.) and M. Holton (Assistant Secretary, R.A.F.M.A.)

THE night express from London slowly drew up at a small wayside station in the heart of the Scottish Highlands early one morning last February. Several grotesque figures in hooded cloth jackets left the train, swinging heavily laden rucksacks on to their backs, and after waiting for the express to move on towards Oban, crossed the tracks and heaved their burdens into the waiting mail-bus. The figures were members of the Royal Air Force Mountaineering Association, some straight from duty the previous day, others from civilian jobs in which they had been employed since demobilization from the Service. In outward appearance they differed in no aspect from other climbers, sharing the eagerness of all climbing addicts on their first day amongst the hills once more. The wayside station was Tyndrum, from which a modern arterial road cuts like a knife through mountains and moorland. Following this route, the mail-bus disgorged the climbers after nearly an hour's journey at the foot of the mountains which cluster around the pass of Glencoe, majestic peaks rising to a height of 3,700 feet on the western seaboard of Argyll.

Stob Coire Nam Beith

Our headquarters were established in a five-roomed cottage, about 100 yards from the main road, owned by the Scottish Mountaineering Club, which we were permitted to use at a charge of three shillings per person per night. This charge included the use of bunks, blankets, coal, cooking stove and utensils. All that we required to bring with us was food, a change of clothing, and mountaineering equipment, the latter belonging to the R.A.F.M.A. This cosy mountain refuge proved so popular and convenient to reach, even in comparison with the nearer climbing centres in the English Lake District and North Wales, that we revisited it on three occasions later in the year, quite apart from meets held elsewhere in the British Isles and on the Continent.

Once the party was established in the cottage we felt ready to brave the worst that Highland weather could hurl against us. However, we can only recall the deep blue skies, the glittering snow-white peaks and russet moorland during our

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winter meet, and the dull heavy haze and wandering showers of a Scottish summer. An occasional day of high wind, driving horizontal rain and rushing burns did, however, occur from time to time, but then we were content to lie snugly on mattresses in front of a roaring fire and in the background the drone of primuses, on which we kept a perpetual supply of hot soup and "char."

The first day of a meet is usually an easy one, during which muscles are loosened and, in winter, conditions are investigated. The meet splits up into small parties of two or three persons, following the same route at intervals or climbing on different mountains altogether. The leader of each party is a climber of some experience, who either knows the district well or has attained a standard of technique sufficiently advanced to be able to lead a party over every hazard encountered. This qualification is a necessity in winter, when, according to snow conditions, an easy rock buttress may become a formidable opponent, up which only an expert can find a feasible route. On the first day, however, we visited Buachaille Etive Mor, an imposing cone of rock, which rises for 2,000 feet above our cottage to attain a height of 3,345 feet. The sun rose crimson over the wilderness of Rannoch Moor to the east, tinging one peak after another with pink. We set off over ever-steepening heather moorland in the crisp morning air beneath a cloudless deep blue sky, the leaders setting the slow steady pace of a mountaineer's tread. The first thousand feet of our climb was not steep enough to warrant the use of a rope, but soon ribs of rock broke out from the grass and heather slope, and each party roped together and separated from the others. The leader moved upwards alone for about 60 feet before securing himself to a projecting flake of rock by means of a separate loop of rope. Here he remained until the second man had joined him and secured himself likewise. If a novice is present in a party, he will follow as the third man on the rope, safely held from above by the tightened rope. Where progress was barred by steep snow or ice, a similar technique was used.

To those watching from below all difficulties appear to dissolve as the leader moves gracefully upwards from hold to hold, affectionately caressing the rock with his fingers. There is scarcely a more exhilarating feeling in life than to feel the warmth of the rocks under a summer sun or in winter to hear the swish of the ice axe as the leader cuts steps in the snow or ice for the rest of the party to follow. But the novice may be deceived by such ease of ascent, when his knees find their way round his neck! His muscles, tense and quivering from strain, cannot be seen by those waiting above. Perhaps a hasty warning may be heard. "I'm coming off!"—a desperate cry as if in preparation for the end. Far from hurtling into space the novice is surprised to find that he drops a mere foot or so while the elasticity of the rope is taken up, and readily regains his holds. The leader above, using a special grip, may scarcely notice the strain on the rope and can, if necessary, haul away until the last man has overcome the difficulty. However, this mishap did not occur during this expedition, for the newcomers learnt rapidly and did not have to overtax their powers.

Moving singly in such manner on steeper rock or snow and together where the ground was more easily inclined, we finally reached the 3,000-feet summit. There is an appeal about a summit cairn, not only the charm of a widespread view of wild mountain scenery and distant waters, so often obliterated by straying clouds, but in the exhilaration that the upward struggle is past, of problems overcome, and that this mighty mass of rock has once again yielded to the conquest of puny man. For climbing is a competitive sport, not man against man, but against a greater foe, which slowly yields to those that learn her secrets but sends death to those who treat her with contempt. But familiarity leads to love,

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and to those who have wrestled with their secrets, the names of favourite mountains bring recollections of happy days of welcomed sport.

The descent is often one of the most pleasant parts of the day. Difficulties can be avoided on most Scottish peaks, and on this occasion we found an easy snow slope, which we could run at full speed, the ice axe being use as a break in case of necessity, and a ski-ing motion of the feet used to increase speed. The novice more readily adopts a more rapid means of descent on his back and seat. Although so comfortable, armchair reveries in this position are always broken by an unwelcome jab from a hidden rock!

And so in gathering dusk each party found its way back to food and warmth. Through the small windows of our homestead the yellow light from the oil lamps, lit by the first party, welcomed the latecomers. To the uninitiated, climbers are hogs, consuming with self-abandoned avarice great mounds of barely palatable food, but with little to eat during the day appetites surge and overwhelm civilized standards of eating. Feasting over, the party gathered together around the dying embers of the fire, the more energetic having struggled into their sleeping bags. The day's adventures were retold and former expeditions recalled; tales became taller and individuals were strangers no more.

Next day parties travelled farther afield. During the night the wind had whipped the newly fallen snow into banks several feet thick. Some returned to the peak of yesterday by a different route, cutting steps up ice-filled gullies and tunnelling the corniced banks of snow at the top. Another party picked the easiest route to the top of a neighbouring mountain with a similar name, Buachaille Etive Beag, 3,200 feet in altitude. The banks of snow proved hard going, but where the wind had swept the old snow clear, the ground was as firm as a pavement, though roughened by tiny crystals of ice, weaving weird patterns and sparkling in the morning sun. We were not the first to reach the summit cairn, for the tracks of a mountain hare led faithfully to the very top, partly circled the cairn and then off in another direction as if the creature was in an unending hurry. Once again we found a snow slope for a quick glissade to the foot of the mountain, a thousand feet being descended in a few minutes. To one party, as if by magic, a mirage of an inn appeared. Through the ingenuity of the leader the party soon found itself at the doors of Kingshouse, a famous hostelry in the midst of moor and mountain. Thus refreshed the last few miles seemed short indeed. We returned to this hotel a few nights later for the meet dinner, a full-dress function in the climbing sense, but in which a dazzling array of rags and tatters meets the eye! In keeping with Highland hospitality the landlord drove us home in the back of a lorry by moonlight. The great precipice of Buachaille Etive towered in silhouette against a star-studded sky. It was freezing hard.

Not many people could say that Election Day, 1950, passed without notice, but in the wilds of Argyll we saw and heard no sign of campaigning. Instead one party tackled the Great Gully of the Buachaille—in summer a straightforward scrable, but now transformed into a minor battle against snow and ice which lasted for seven hours. The climb was finished and the summit reached in darkness, but the moon shone clearly in a cloudless sky and guided all parties to safety.

Several parties visited Bidean nam Bian, the monarch of the district, surrounded by many subsidiary peaks in attendance for several miles on nearly every side. On account of these formidable ramparts the majestic summit bastion is rarely seen by the motorist or roadbound tourist. No description can adequately record the beauty of the inner recesses of this mountain chain, where wooded hanging valleys and stone-strewn corries lead up to the final snowclad

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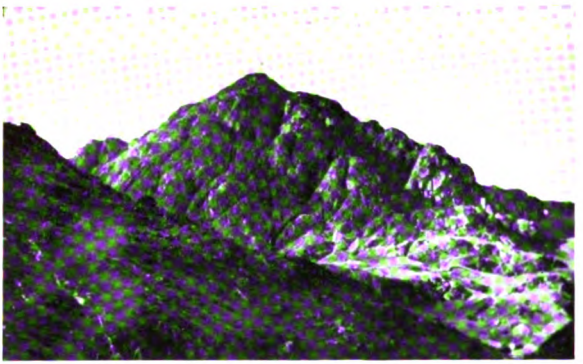

Stob Coire Nam Beith
(From the Corrie)

buttresses, which sweep upwards for nearly 1,000 feet to the three summit towers. One tower, Stob Coire Nam Lochan (or peak of the corrie of the little lochs, 3,657 feet) was assaulted by means of the North Central Gully, a cleft which divides the series of buttresses on the north side. The gully was mainly filled with snow, in which a series of steps could be kicked for most of the way until the cairn at the top was reached; from there an easy ridge led to the second and highest tower. The third tower was scaled by two leaders via a buttress known as the Sphinx from an obvious resemblance to that edifice, a new winter route being made up the hindquarters. A grim struggle ensued against iced rocks and powder snow, which had to be cleared off the rock before each handhold or foothold could be used. The outcome of the ascent was in balance until the summit was attained, in case a way could not be forced in the limited daylight available and in consequence descent would be the only alternative to benightment. Our gloves froze solid within a minute of taking them off, but such was the heat of energy expended and the suitability of our clothing that the biting coldness of our surroundings passed unnoticed in the ardour of our ascent. The final cone of Stob Coire Nam Beith (the peak of the corrie of the birch trees, 3,621 feet) was reached as the sun was setting. Our relief at escaping from the unknown maze of ledges, gullies and walls was overwhelmed by the spectacle which lay before us on the far side of the summit ridge. Climbing in shadow all day with a limited view of the north, we were now looking across the few minor ridges which lay between us and the sea and islands beyond, behind which the sun had recently set in a wintry glory of red and orange. As darkness began to fall inland, patches of pale green sky, so characteristic of winter in these northern latitudes, slowly faded in the gathering gloom. A sharp easterly breeze prodded us into action again and we descended by easy ridges and snow slopes into the ink-black depths of the valley below.

Another meet had come to an end. New climbs had been done and old ones revisited. Novices had learnt the feel of an axe and aspiring cooks had learnt how much pepper should be put in the soup! Some returned to stations, others to civilian life in city and town, having forged a link with their past Service career, with pleasant memories of acquaintances formed and renewed.

We had trodden where no man had trodden in winter before. Later in the year two gullies and a ridge were climbed in summer conditions where records show that no climber had been. On these occasions novices were allowed to participate in our adventures and share the enthusiasm which radiates from a party, as the final difficulties fall to the assault of the leader, and nature no longer bars the way to the highest. Such spirit is truly in the heart of mountaineering and in the tradition of the Royal Air Force today.

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DOWN A CREVASSE

By Wing Commander E. B. Beauman

ALTHOUGH the weather was fine again, the high Zermat mountains were covered with snow that July day, so my very young guide, Irwin Lochmatter—one of the famous Lochmatter family—and I had contented ourselves with wandering over a small rock peak about 11,000 feet high which lies above the beautiful St. Niklaus valley. It had been a pleasant day's scramble in the warm sunshine, with fine views of shining white glaciers and jagged ridges all round us.

We had left the last of the rocks and were strolling leisurely over a smooth snowfield towards the valley. Suddenly, without the slightest warning, I felt myself falling; then came a terrific jolt and there I was neatly wedged at the bottom of a V-shaped crevasse. On either side, for at least 20 feet, rose smooth blue walls of ice. Above I saw a white snow roof with a small hole in it through which I must have dropped. I looked down and at my feet on the ice was a pool of blood. "That's funny," I said to myself, still half-stunned, "someone else must have fallen in here earlier today!" Looking more closely I found that my ice axe —which I still gripped firmly in one hand—had deeply gashed my other wrist.

Then, to my astonishment, I heard another human voice, and for the first time I noticed young Lochmatter looking rather dazed but still smiling, lying a few yards away; and I realized that I must have pulled him down on the rope during my fall.

Some huge crevasses on the 24-mile long Franklin Glacier (coast range of British Columbia)

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Next came the urgent problem of how we were to escape from our dim ice prison. A conference on the subject was not at all easy as my guide only spoke German of the Swiss variety, while my knowledge of that language is strictly limited. However, by various grunts and signs, Irwin managed to convey to me that he wanted to stand on my shoulders and try and hack steps with his ice axe up the steep ice wall. After a short and (to me!) uncomfortable struggle, he managed to carry out the first part of his programme, but in spite of a shower of hard ice lumps on my head, it soon became evident that we were not going to get out by those methods; and rather to my relief Lochmatter descended again to the bottom of the crevasse.

By now the situation was not at all healthy. We had been down below for more than half an hour, the air around us was icy and we were getting very cold. We were beginning to wonder to what a state we would be reduced after an hour or two in such a temperature. There seemed to be only one hope left, and that a slender one. This was to shout as loud as possible just in case someone might come within earshot. But, we knew very well that our small and almost unknown peak was seldom visited. So Lochmatter began yodelling plaintively every ten seconds, which is the international distress signal. For some time there was no other response except his cries echoing among the neighbouring peaks. Then, after about half an hour's anxious suspense, to our immense surprise and relief there came an answering shout. By great good fortune another party had had the same idea as ourselves for a climb that day. They had seen us as two distant specks in the snowfield, and as, when they looked again, the specks had vanished, they realized what must have happened and hurried to the spot.

Before very long our rescuers had reached the edge of the crevasse and lowered ropes on to which we had some difficulty in tying ourselves with our frozen fingers. Then came some hard and painful pulls and we were out once again in the bright sunshine of the outside world. Fortunately no serious damage had been done in the fall, and before long, after a welcome kirsch, rather bruised, cut and shaken, we were soon limping down the rough path to St. Niklaus, 5,000 feet below.

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LECTURERS

By Group Captain J. Heber-Percy, *p.s.a.*

LISTENING to a lecture need not be limited to an effort to absorb information about the subject under discussion, but can simultaneously be part of a "lecturer-analysis" game. To call it a game sounds perhaps flippant, but, in fact, useful lessons are learnt in this way which the listener may or may not be able to put to his own advantage in the future.

The game, if so it may be called, consists of a concentrated study of the lecturer, his personality, mannerisms, voice, presentation of lecture, wit, dress, and so on, from the moment he enters the lecture hall until the last question is answered. There is so much more to a lecture than just the bare text, which might well be used by two different lecturers with completely opposite results on the same audience. It is in the hands of the individual lecturer to nurse his audience into a mood of receptivity and appreciation. Pity the poor lecturer! His is the battle to be fought single-handed while the massed audience sits quietly enjoying the role of jury. This is, of course, presuming that the audience is composed of normally well-behaved persons. Political harangues with their equal and opposite reactions are excluded.

"To nurse his audience into a mood of receptivity and appreciation"

Watch the victim as he enters. Is he nervous and fidgety, smiling and over-confident, or restrained and dignified? The first summing-up of his character requires a quick appreciation, and is often proved wrong. The smiling face may be the result of a joke whispered in his ear just before entering the hall. Next he mounts the dais and faces the audience while the chairman makes a few introductory remarks. During this short period the experienced lecturer calmly surveys his audience, possibly smiling at some old friend, while the novice is more likely to be silently repeating to himself his opening lines.

A joke or an apology at the beginning of a lecture, so often regarded, apparently, as the accepted opening gambit, is only likely to be successful if it reveals that the lecturer has studied the character of his audience and

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knows how to appeal to their humour or sympathy. Evidence of such interest is flattering and productive of respect. Otherwise this form of beginning is likely to be taken as an attempt at cheap popularity.

The next revealing indication of the type of lecture to be expected is the ability of the lecturer to stand still, face his listeners, and speak loudly and clearly enough to be heard throughout the hall. So many well-intentioned lecturers, having been previously warned of poor acoustics, start their lecture by asking in a parade-ground voice whether those at the back of the hall can hear, and being reassured (almost inevitable in a well-disciplined crowd of students), relapses quickly to his normal tone of voice which is inaudible to all but the front rows. Lack of carrying power is too frequently further emphasized by the lecturer directing his remarks towards his script some feet below him, or worse still, by turning his back and talking at a map. In school days that sort of thing immediately resulted in paper darts being hurled, stink bombs being let off, and other pranks being performed simply because the attention of the audience was no longer held. Although an adult audience does not react in such practical ways, the effect on their attention is similar. Incidentally, the trick of looking at a map while talking is sometimes pure habit and entirely unrelated to the immediate references being made. Once looked at, it seems to exert a hypnotic influence on some lecturers who will continue to focus their eyes on the Cape of Good Hope while answering a question on the power of Communists in British Trades Unions.

Once the lecturer has got firmly into his stride the next thought in the mind of the "player" is "How long will he continue?" In the best circles the approved time limit is forty-five minutes, and it certainly takes a good lecturer to keep the attention of his audience for longer than that time without a break. Few are the lecturers who know their subject and their own ability well enough to round off a well-ordered and comprehensive talk on the stroke of forty-five minutes. It is a fact that the majority run over the time limit and thereafter fall into one of two categories, those who are so carried away by their own eloquence that they are oblivious of time, and those who keep anxiously glancing at the clock and apologizing. The unforgivable offender is he who spends the last quarter of an hour (over time) alternately raising and dashing the hopes of his audience by the continued use of such phrases as ". . . and now for the last few minutes I should like to . . ."; "In conclusion I would 'say' "; ". . . but before I finish I must tell you something of . . ."; and so on, until his listeners writhe with frustrated hopes. Of course, there are lecturers who talk for twenty-five minutes and then announce that they have said all they have to say, and feel sure that any points they've missed will be brought up at question time. That, surely, is the hallmark of the really knowledgeable and intelligent lecturer, knowledgeable because he is prepared to face the bowling at question-time and intelligent because he is not prepared to risk boring his audience by talking for too long. Most deceptive of all is the exquisitely phrased and timed address, studded with apt insertions of wit and personal reminiscence, which though in itself a work of art and good entertainment, is too often the product of dramatic ability rather than sound knowledge of the subject of the lecture. Question-time soon proves whether these fears are well founded.

Perhaps the author will be accused of being over-critical, but six months of listening to lecturers of varying calibre produces an analytical mind, particularly when the chairs provided in the lecture hall are such that only an Indian fakir could relax on them.

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ROYAL NEW ZEALAND AIR FORCE

By Flying Officer G. Bentley

NEW C.A.S. FOR R.N.Z.A.F.

AIR VICE-MARSHAL DAVID VAUGHAN CARNEGIE, C.B., C.B.E., A.F.C., R.A.F., has been appointed Chief of Air Staff, Royal New Zealand Air Force, succeeding Air Vice-Marshal Sir Arthur Nevill, K.B.E., C.B., R.N.Z.A.F., who is retiring from the service.

The appointment of an R.A.F. officer as C.A.S. represents a break with recent practice, for since 1943 this post has been held by a New Zealander.

Predecessor to Sir Arthur Nevill was Air Vice-Marshal Sir Leonard Isitt, K.B.E., whose association with the R.N.Z.A.F. goes back to its earliest days. Reversion to the former practice of appointing an officer from Great Britain has given cause to some speculation and much interest. R.A.F. officers served New Zealand's air force as C.A.S. in the early years of World War II—and served it exceedingly well. Grave world conditions have no doubt persuaded the governments concerned to obtain for New Zealand a man who has first-hand knowledge of overseas developments, and in this respect Air Vice-Marshal Carnegie is well qualified.

Born on 7th February, 1897, in Leicester, he was educated at Kellard College, Leicester, Collegiate College, Leicester, and Wyggeston Grammar School. A son of the Rev. J. D. Carnegie, of Aberdeen, Leicester, and Stamford, he has a Scottish home at Dundargue Castle, near Fraserburgh. Since 1948 he has been back in Scotland as Senior Air Force Officer and Air Officer Commanding, No. 18 Group, Coastal Command.

After leaving school he went to the United States and Canada, returning at the outbreak of World War I to join the Royal Naval Air Service. For the next fifteen years he was a flying-boat pilot, first in the R.N.A.S. and later in the Royal Air Force. In 1927 and 1928 he piloted one of a flight of four Southamptons on an eighteen months' cruise of the Far East, India and Australia. He and his colleagues, incidentally, pioneered the Calcutta—Rangoon—Singapore route, now much used by Empire class flying-boats. After a period as commander of the flying-boat training unit he underwent, in 1932, a Staff College course. A keen pilot, he acted in his spare time as honorary instructor of several flying clubs at home and abroad. During the 1930's, while holding various positions in the R.A.F., he flew his own Moth aircraft in two King's Cup races and also did much private flying on the Continent.

At the outbreak of World War II he was commanding officer of the fighter station at Wittering, Northamptonshire. In 1940 he was appointed to Fighter Command Headquarters as Group Captain Operations and was responsible for the standardization of interception technique—an important task at the height of the Battle of Britain.

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[Air Ministry photo

Air Vice-Marshal D. V. Carnegie, C.B., C.B.E., A.F.C., is seen fourth from the left in happy mood in 1942, after a tour of British Training Centres in U.S.A.

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In 1941 and 1942, Air Vice-Marshal Carnegie was in the U.S.A. setting up the British flying training schools and supervising the training of R.A.F. pilots there. On his return to the United Kingdom he became Director of Flying Training at Air Ministry, a post he held for two and a half years before going to Canada in 1945 as head of the U.K. Air Liaison Mission and as R.A.F. advisor to the British High Commissioner.

He was promoted acting air vice-marshal in March, 1945, later reverting in peace-time to his war substantive rank of air commodore.

Air Vice-Marshal Carnegie was awarded the Air Force Cross in 1919. He was made a Companion of the Order of the British Empire (Military Division) in 1945 and had the Legion of Merit, Degree of Officer, conferred on him by the President of the United States in 1946. He was made a Companion of the Order of the Bath (Military Division) in January last year.

Married in Florida in 1942, he has two daughters. His hobbies are golf and fishing.

As the Royal New Zealand Air Force faces many problems in common with other Dominion air forces, and is in the throes of re-equipping with modern aircraft, the new Chief of Air Staff will find many important tasks awaiting him to fit the R.N.Z.A.F. for the role it would be required to fulfil in the unhappy event of war.

REARMING THE R.N.Z.A.F.

The Royal New Zealand Air Force will this year re-equip its flying establishments, both training and operational, with more modern aircraft. Orders have been placed in the United Kingdom for four types in current use elsewhere in the British Commonwealth. These are de Havilland Devons, for advanced aircrew training; de Havilland Vampire jet fighters, for ground attack duties: Bristol Freighters, for short haul, and Handley Page Hastings, for long-range transport.

Because it was recognized that the supply position could alter, the initial order has been placed subject to confirmation by Air Ministry.

Plans for replacing the R.N.Z.A.F.'s war-time machines, most of which have given long and faithful service, follow the post-war policy of buying British aircraft. During the war, the R.N.Z.A.F. obtained the biggest part of its operational and transport aircraft under Lend-Lease. The fighters and bombers which flew in the war in the Pacific have since been reduced to scrap, and the only American types still in existence are found in the transport and flying-boat squadrons.

The arrival of the new aircraft will enable the Service to replace its obsolescent machines and will better fit the R.N.Z.A.F. for home defence and the protection of those Pacific Island territories for which New Zealand accepts responsibility.

The first Vampires to reach this country will re-equip the fighter squadrons of the Regular Air Force; the conversion of the Territorial squadrons to this type will follow. The Vampire has proved its ruggedness time and again and can be found today in service with the air forces of the British Commonwealth, in almost every country in Europe, in the Middle East, the Near East, and in South American republics.

The Devons have been selected as advanced trainers for pilot conversion and navigational training. A standard version of the Devon is already in service with the R.N.Z.A.F. as a communications aircraft.

A Bristol Freighter (Type 170) from the United Kingdom visited New Zealand

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in 1947 in the course of a demonstration tour. Like the Devon and the Vampire, it is seeing service in many parts of the world. The R.N.Z.A.F. will investigate with trials its usefulness in the aerial top-dressing of hill-country farming lands in the Dominion, a project of major importance to New Zealand at present and one which had the full co-operation of Group Captain W. C. Sheen, D.S.O., O.B.E., R.A.F., when he was Deputy Chief of Air Staff in New Zealand in 1948 and 1949. By using the Freighters for this work, as well as for Service transport duties, the Government could, it is believed, contribute largely to the reclamation of marginal lands in New Zealand, and vastly increase the country's primary producing capacity.

The Hastings aircraft will go into service with the R.N.Z.A.F. for long-range communications. Also a proven type—they were thoroughly tested in the Berlin air lift—there are many uses to which they could be put. New Zealand saw its first Hastings in 1945, when one paid a short visit to major R.N.Z.A.F. stations.

Although these machines are neither the latest, fastest nor largest aircraft available, they are all standard equipment in Commonwealth air forces and are tried and proven types. For these reasons they are the types most suited to the immediate requirements of the R.N.Z.A.F.

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BOOK REVIEWS

Stolen Journey. A thrilling account of an escape from Stalag Luft III. By Oliver Philpot. 412 pp. Illustrated. (Hodder & Stoughton; 15s.)

(Typical example of the illustrations. The suit-case "J. J." indicates the "escapee.")

Who, having read *The Wooden Horse* or seen the film of that epic escape, has not been filled with the desire to know how the R.A.F. officer fared, who escaped with the two Army officers? What adventures did he meet with between leaving that tunnel under the barbed wire of Stalag Luft III until that unexpected meeting at the British Legation in Stockholm with the other two members of the escape party, whose exploits we have already read with such interest? *Stolen Journey* tells us all of this and more. It provides a thrilling story with not a dull moment. The author captures our attention from the first page, carrying us with him, in imagination, on his last operational flight, to be with him and his crew in their rubber dinghy, after being shot down over the North Sea. The sensations experienced then and those later as a prisoner of war are "put over" in a naïve manner which makes pleasant reading.

His life in the various prison camps, the numerous abortive attempts at escape and then at last the successful escape project itself are described with vigour and skill. His account of the preparations for that escape are in no sense a repetition of anything in *The Wooden Horse*. It gives a different angle to that story which is most satisfying. You come to share the author's loathing for the flat, sandy corral which was Stalag Luft III. With him you plan the perfect character for travel across Germany—if only you can escape. When the great moment comes, you share the seething rebelliousness at the coffin-like narrowness of the "wooden horse tunnel." You share his acute anxiety of mind in his hazardous travels in first one train and then another, disguised as Jan Jörgensen, the suave Norwegian representative of a margarine firm, whilst en route for the frontier and hoped-for freedom. The strain becomes still more acute as in the darkness he climbs that Norwegian ship's cable like a monkey, almost under the noses of German sentries.

This exciting account, by the first Royal Air Force officer to escape from Stalag Luft III, which might well have been labelled "abandon hope all ye who enter here," and his adventures during his swift flight to freedom, is well written and holds the reader's interest

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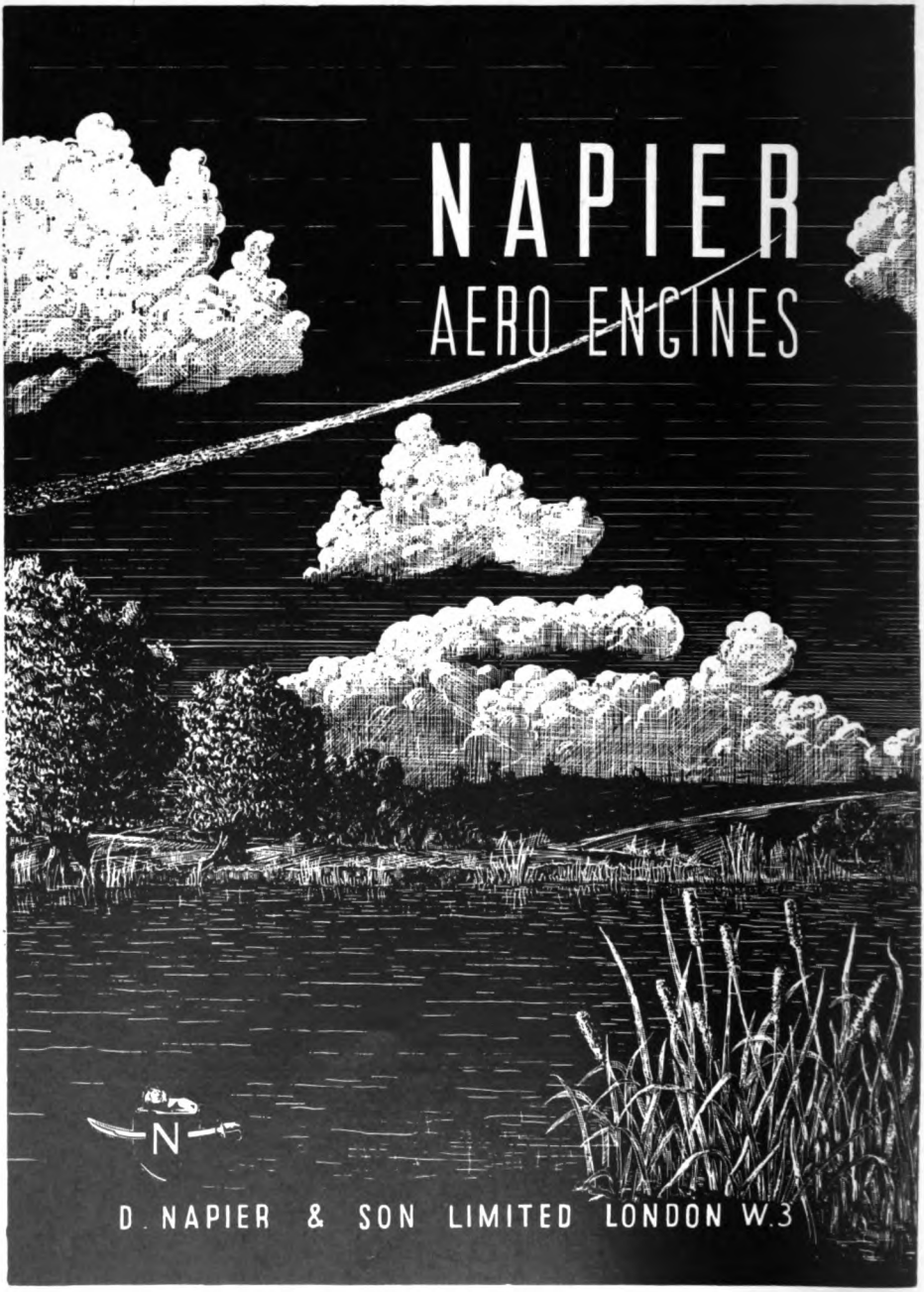

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from beginning to end. The writer has a fine sense of narrative and description; unconsciously he conveys that indefinable quality of character and mind which is so typical of the best of our airmen, which, by refusing to accept defeat, must have stood him in good stead in his long imprisonment and through the most hazardous moments whilst escaping.

It is an excellent thing that such true stories should be published, so fostering pride in our race and all that is best in our character.

A. H. S.

The Red Beret. A history of the Parachute Regiment. By Hilary St. George Saunders. 336 pp. Illustrated. (Michael Joseph; 15s.)

Being a detailed history of the Parachute Regiment, this book is primarily for those whose military service would enable them to be familiar with the names of the numerous gallant officers and men which fill its pages, as well as the very detailed description of the training and battle actions of this famous Regiment.

For members of the Royal Air Force, whose co-operation in the brilliant exploits described linked them so closely to this Regiment, it provides absorbing interest in the fullest measure.

To every member of the Commonwealth of Nations it offers reading which will thrill them when they read of the heroic deeds and tragic sacrifices of the bravest of our race. Although those whose exploits it recounts possess the melancholy distinction of having lost more than half their effectives every time they went into action, such tragic losses are forgotten in the glory of their deeds, which—and it was ever thus in war—will be remembered longer than the costly sacrifice in lives upon which their traditions are built.

After the tremendous success of his earlier book, *The Green Beret*, Mr. Saunders's qualifications for writing this history need little emphasis. The true greatness of these men is accurately painted by an experienced author, whose brilliant narrative of their deeds is blended with humour and sympathy, making not only an important historical record but an immensely exciting story. It is a stirring record, beginning with the attack by a handful of men on an obscure viaduct in Southern Italy, and ending with the triumphant drop of an entire division on the far side of the Rhine. In it is included a full and tragic account of the glories of the Battle of Arnhem.

A. H. S.

Refuelling in Flight. By C. H. Latimer-Needham M.Sc.(Eng.), F.R.Ae.S., M.S.A.E. 191 pp. Illustrated. (Sir Isaac Pitman & Sons; 12s. 6d.)

This book combines a brief history of research and development with a description of the operating technique employed and an analysis of the economics which prove the case for flight refuelling. It should be a useful text-book to the aeronautical engineer and the R.A.F. strategist, for an aircraft designed from its inception to take on fuel in flight has an immense advantage over its predecessor, whose range is limited by the capacity of its fuel tanks. The technique for its use is applicable to aircraft which are piston-engined or jet-propelled. The author's experience of flying dates back to the First World War, when he served as a pilot with the Royal Flying Corps, and since that date he has been engaged in a technical capacity with most phases of aircraft design, construction and experimental flying. Some of the most recent developments of flight refuelling in Service aircraft and the results achieved have, for security reasons, not been included in this otherwise comprehensive work. Nevertheless, the same technique is applicable to jet air liners which will be operated over long-distance air routes rendering a major contribution to air line economy.

The book concludes with a chapter dealing with the military economics of flight refuelling, showing how economy of effort can be achieved, as well as extreme range. The possibilities of flight refuelling have additional interest since the introduction into the Service of jet-propelled aircraft, whose high rate of fuel consumption tends to offset the advantage of greater speed; it offers the needed increase in endurance and range comparable with piston-engined aircraft.

A. H. S.

Richard Hillary. By Lovat Dickson. 202 pp. Illustrated. (Macmillan & Co. Ltd.; 8s. 6d.)

Mr. Dickson admits in his preface to this book that he fears "it will be asked by many who have read *The Last Enemy* why anyone should write a life of Richard Hillary when, presumably, all that he wanted to record of his own thoughts and experiences is in that

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book." There is reason for his apprehensiveness, and yet most of us who have read Hillary's own first and last classic must have wished at times to know a little more about the childhood that produced such a complex character, and of the few remaining months before he took-off one night for his final encounter with "the last enemy."

Much of the missing detail is in this new book, drawn from "the analyses of character which Eric Linklater and Arthur Koestler have so skilfully provided, the fond memories of his friends and family, and passages from those moving and passionate letters Hillary wrote in the last months of his life." It is inevitable that the result is sometimes a little too sugary, although there is little attempt to hide the fact that the young Richard was by no means everybody's idea of a saint ! Indeed, Mr. Dickson refers to Richard the schoolboy as being "in outward appearance a nice-looking, well-brought-up young Englishman of the best class, but within an unpredictable, dynamic individual, capable alike of considerable mischief, of unrelenting obstinacy or of unusual achievement."

There are plenty of good stories to illustrate every aspect of this character, which changed little when he achieved manhood, but the most remarkable characteristic that emerges is, perhaps, the similarity between the views of the adult Richard Hillary and those of T. E. Lawrence. Both found contentment and a new purposefulness in life in the Royal Air Force, and both asked Eric Kennington to paint their portraits, knowing that Kennington's genius could help them to "interpret themselves" at a time when they were full of self-doubts. Significantly, it was as a result of reading Kennington's copy of Lawrence's unpublished stories of life in the R.A.F. (*The Mint*) that Hillary decided to return to flying.

When reading the last chapters of *Richard Hillary* one cannot help feeling that he should not have been allowed to make that decision, especially as it involved periods of night flying in none-too-serviceable aircraft which his poor skeleton fingers could barely control. But if one reads again *The Last Enemy*, even those doubts disappear.

J. W. R. T.

Observers' Tale. The story of Group 17 of the Royal Observer Corps. 172 pp. Illustrated. 21s., plus 1s. postage. Obtainable from H. R. Whitty, White Walls, Carbone Hill, Cuffley, Herts.

Few war-time members of the Royal Air Force will need to be reminded of the fine service performed by the Royal Observer Corps, whose never-ceasing reports guided our fighters in defence of these islands for five and a half years, and helped to bring home safely countless crippled aircraft of the R.A.F. and U.S.A.A.F. Yet these were but two of the jobs of the R.O.C., whose other duties included "spotting" for the D Day invasion fleets and operation of the local factory air-raid warning system that helped to maintain a high level of production during the peak of the "blitz."

Observers' Tale is the story of No. 17 Group of the Royal Observer Corps, which is centred at Watford and whose posts cover a large area of London and the Home Counties north of the Thames. It is, however, so wide in scope that it can be regarded almost as a history of the Corps as a whole. It begins with brief notes on the work of the Observer Corps in the First World War and between wars, followed by an account of its first major testing in the Battle of Britain, in recognition of which His Majesty The King granted to the Corps the title of "Royal."

If the value of the R.O.C. had ever been questioned, that battle provided the answer, for its few thousand enthusiastic amateur "spotters" formed an invaluable part of the fighting team that intercepted and broke up the enemy attack. Later, when enemy pilots were replaced by mechanical "brains" in Hitler's V.1 "flying bombs," men and women of the Royal Observer Corps again directed the Tempests, Meteors and Mosquitoes that eliminated this final menace to London. The close kinship with R.A.F. Fighter Command which these actions produced has been maintained to this day, when the Royal Observer Corps is under the direct operational and administrative control of that Command.

Although this is a friendly, intimate story, originally intended only for members of No. 17 Group, it has a strong appeal for all members of the Service whose grey-blue uniform is shared by the R.O.C. It is a book that should also be in every public library, for then the Corps would have no difficulty in attracting recruits, which are still urgently needed.

J. W. R. T.

Wingless Victory. By Anthony Richardson. 256 pp. Illustrated (Odhams Press; 9s. 6d.)

This is a true story, correct in every detail as told to the author by Air Marshal Sir Basil Embry, K.B.E., C.B., D.S.O., D.F.C., A.F.C., present Commander-in-Chief, Fighter Command, R.A.F. It is the story of the epic lone escape from the midst of the German Army

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in 1940, of an R.A.F. wing commander, who had the misfortune to be shot down whilst leading his squadron in a bombing raid for the last time, being due to take over a bomber station the next day on promotion to group captain. The skill of the author very quickly has his readers living again through that anxious period of 1940. France overwhelmed and overrun by the German Armies, broken and on the verge of capitulation; the tragedy and triumph of Dunkirk; our own desperate situation, which seemed then to be so aptly expressed by those well-known lines : "How can a man die better, than facing fearful odds, for . . . and the country of his gods," etc. Then interest becomes focused on that lone figure which, taking a thousand to one chance, has dived into a ditch on the side of the road from a column of marching prisoners of war, closely guarded by Germans mounted in lorries with machine-guns. It is a moment of suspense for the reader; what must it have been to that wing commander? Alone by his courage and wit and determination he faced and struggled through one seemingly hopeless situation after another, each occasion requiring rapid thinking and determined action. Although he was three times captured they never succeeded in conveying him to a permanent prison camp in Germany. On one occasion he lures his guard into his temporary cell, floors him with a straight left; taking his guard's rifle, he "lays-out" two more guards before diving into a manure heap, where he remains successfully hidden for six hours until eleven at night, when he makes a further bid for freedom. He is later recaptured and this time bluffs his way out, under interrogation, by sheer native wit. That all this time he is dressed in civilian clothes (his first outfit borrowed from a scarecrow in a field) with the liability of being shot out of hand by his captors added to the desperate situation. Yet, with seemingly the world against him, he makes his way on foot right across France, and back to England to fly and fight again and get two more D.S.Os. in the process.

Much time and paper has been expended upon the theory of "morale" and the type of discipline and morale that the Royal Air Force training aims to build up among its officers to produce "leaders of men"; no better example of the success that can be achieved could be found anywhere than in this true story of the obvious high standard of morale of this R.A.F. wing commander, who has many times proved his ability in leadership and is now Commander-in-Chief of Fighter Command. Yes ! It is his own story that he told to the author of this book. A modest man at heart, it must have cost Sir Basil quite a deal more courage to give his own story for publication. Its good effect will be limitless and the R.A.F. and this country should be grateful to him for overcoming at last his disinclination to make his story known. This is another shot fired in the cause of the "morale rearmament" of this country. The memory of such deeds will stimulate others to emulate them when their time comes.

A. H. S.

Brassey's Annual, 1950. Edited by Rear-Admiral H. G. Thursfield. 363 pp. Illustrated. (London: William Clowes & Sons; New York: The Macmillan Company; 50s. net.)

Brassey's Naval Annual this year in a new form. It has been transformed into *The Armed Forces Year Book*. To Service readers and the general public this book is a veritable mine of information, not only on our Navy, Army and Air Force but contains considerable information on the armed forces of other Powers.

The events, developments and opinions of the past year concerning our defence forces provide interesting reading, primarily to Service personnel, but it will appeal equally to all interested in the importance of national defence.

As this is the first issue to deal directly with the Army and Air Force as well as the Navy, the early history of the Services now added is given, with an outline of their gradual development up to the present.

The information given is in considerable detail—the fact that it is authoritative makes it a valuable book. The first section deals with defence as a whole, and the other three each with one of the Services.

When surveying problems involved in matters of strategy, policy and administration the emphasis throughout is upon the essential need for the unity of the three Services as members of the nation's defence team.

To those who have chosen a Service career this book of general knowledge of our armed forces is an invaluable book of reference which will greatly assist in a closer understanding of the problems, the aims and organization of all three fighting Services which form our national defence force.

A. H. S.

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NEW BOOKS

AIR AFFAIRS

Refuelling in Flight. By C. H. Latimer-Needham. 191 pp. Illustrated. (Pitman; 12s. 6d.) A brief history of research and development with a description of the operating technique employed and an analysis of the economics which prove the case for flight refuelling.

Between Earth and Sky. By Auguste Piccard. 157 pp. A book about the Stratosphere. (Translated from the French.)

MILITARY

Happy Odyssey (Memoirs). By Lieut.-General Sir Adrian Carton de Wiart. 287 pp. (Jonathan Cape.) The author was Mr. Churchill's personal representative to General Chiang Kai-Shek.

U.S.A.

The Development of Tactical Services in the Army Air Forces. By John M. Coleman. 298 pp. (Columbia University Press.) An authoritative account of the development of the service and maintenance organizations which were the backbone of the Army Air Forces during the Second World War.

BRITISH COMMONWEALTH

The British Family of Nations. By John Coatman. 271 pp. (Harrap, London.) Describes the British Commonwealth of Nations as a working concern. With a chapter on Defence.

MIDDLE EAST

The Middle East. A political and economic survey. 496 pp., with 3 maps and 5 appendices, including one on the Covenant of the League of Arab States and another on Oil, with some production figures. (R.I.I.A., London and New York: Chatham House.)

Cordon and Search. With the Sixth Airborne Division in Palestine. (September, 1945, to May, 1948.) 275 pp. By Major R. D. Wilson. With maps, plans and appendices, including a chronology of events during the above period. (Gale & Polden, Aldershot.)

U.S.S.R.

Public Opinion in Soviet Russia. By Alex. Inkeles. 379 pp. (Harvard University Press.) A study in Mass Persuasion, with a chapter dealing with the Soviet press and a bibliography.

Post-War Treaties of the Soviet Union. By L. B. Schapiro. (Stevens & Sons Ltd., London.) Essay on "The Year Book of World Affairs, 1950": 150 pp., with a chart of the Eastern European Treaty System.

Russia and the United States. By P. A. Sovokin. 213 pp. (Stevens, London.) Second Edition. First published in U.S.A. in 1944 by Dutton, New York.

ARTICLES OF INTEREST IN CURRENT PERIODICALS

"Political Quarterly," July, 1950. Pages 288 to 300.
"Conscription: A Defence," by Woodrow Wyatt, M.P.

"The Engineer," 11th August, 1950. Leading article, page 152.
"The Defence Programme."

"Economist," 12th August, 1950. Pages 325 to 330.
"Economics of Rearmament."
(1) Measuring the Burden.
(2) Is Productivity Enough.
(3) Manpower at Strength.
(4) Export Policy Now.
(5) Mechanisation—A Case Study.

"Fortnightly," August, 1950. Pages 84 to 89.
"Japan and Korea," by O. M. Green.

"National and English Review," August, 1950. Pages 185 to 191.
"A Fortnight that Changed the World (Korea)," by Denys Smith.

"Aeroplane," 11th August, 1950. Pages 158 to 160.
"Pakistan's Air Force," by K. L.

"Economist," 5th August, 1950. Pages 267 to 268.
"Men Behind Mobilisation." (Leading personalities in American Defence.)

"Air University Quarterly Review," Spring, 1950. Pages 5 to 16.
"Formulating the U.S.A. Air Force Program," by Dr. F. M. Mayx.

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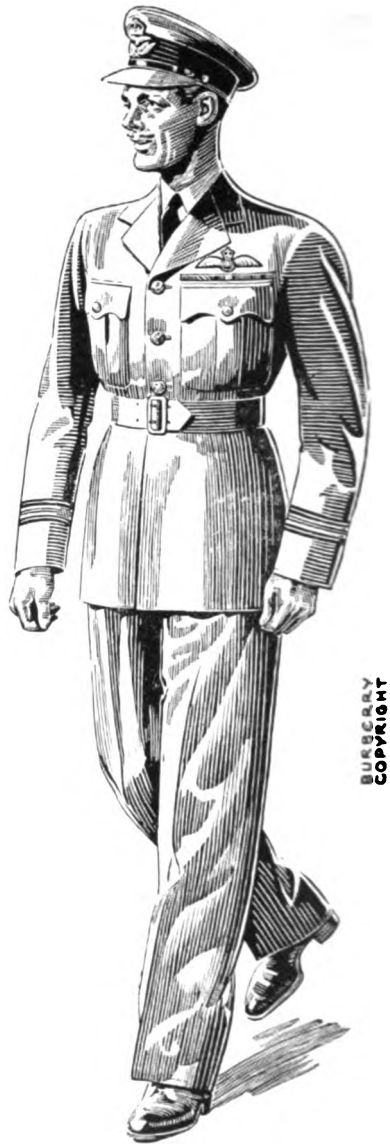

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CONCERNING PERSONNEL

ROYAL AIR FORCE PROMOTIONS AND APPOINTMENTS

Among the promotions and appointments announced by the Air Ministry since the issue of the October, 1950, number of this Journal are the following :

SPECIAL APPOINTMENT

Air Vice-Marshal D. V. Carnegie, C.B., C.B.E., A.F.C. His Majesty's Government in the United Kingdom have placed this officer's services at the disposal of the Government of New Zealand, for appointment as Chief of the Air Staff of the R.N.Z.A.F., in succession to Air Vice-Marshal Sir Arthur Nevill, R.N.Z.A.F. He takes over his appointment early in 1951.

[Air Ministry photo

Air Vice-Marshal S. C. Strafford, C.B., C.B.E., D.F.C.

HOME COMMANDS

Air Marshal Sir Thomas Melling Williams, K.C.B., O.B.E., M.C., D.F.C., to be Air Officer Commanding-in-Chief, Home Command, with effect from 15th March, 1951.

ROYAL AIR FORCE REGIMENT

Air Vice-Marshal Stephen Charles Strafford, C.B., C.B.E., D.F.C., to be Commandant-General of the R.A.F. Regiment.

BOMBER COMMAND

Air Vice-Marshal George David Harvey, C.B.E., D.F.C., as Senior Air Staff Officer, Bomber Command.

COASTAL COMMAND

Air Vice-Marshal Harold Thomas Lydford, C.B., C.B.E., A.F.C., as Air Officer Commanding, No. 18 Group, and Senior Air Force Officer in Scotland.

Air Commodore G. W. Tuttle, C.B., O.B.E., D.F.C., as Air Officer in Charge of Administration at Headquarters, Coastal Command.

WESTERN UNION

Air Marshal Somerled Douglas Macdonald, C.B.E., D.F.C., as Inspector-General of Air Training, Western Union. (A newly created post.)

MAINTENANCE COMMAND

Air Vice-Marshal Edward Crisp Farman, C.B.E., as Senior Air Staff Officer, Maintenance Command.

Air Vice-Marshal Hugh Granville White, C.B.E., to be Air Officer Commanding No. 41 Group.

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FIGHTER COMMAND

Air Commodore Michael Watson, C.B.E., to be Chief Signals Officer at Headquarters, Fighter Command.

AIR MINISTRY

Air Vice-Marshal Alfred Charles Henry Sharp, D.S.O., A.F.C., as Director-General of Organization, Air Ministry.

Air Vice-Marshal Theodore Neuman McEvoy, C.B.E., to be Assistant Chief of Air Staff (Training), Air Ministry.

Air Commodore V. G. A. Hatcher, O.B.E., A.F.C., as Director of Signals (Organization), Air Ministry.

OVERSEAS COMMANDS

British Air Forces of Occupation, Germany

Air Marshal Sir Robert Mordaunt Foster, K.C.B., C.B.E., D.F.C., to be Commander-in-Chief, with effect from 15th March, 1951.

[Air Ministry photo

Air Marshal Sir Robert M. Foster, K.C.B., C.B.E., D.F.C.

Far East Command

Air Vice-Marshal Robert Stewart Blucke, C.B., C.B.E., D.S.O., A.F.C., as Air Officer Commanding, Headquarters, Malaya.

Air Vice-Marshal Hubert Leonard Patch, C.B.E., to be Air Officer in Charge of Administration, H.Q., Far East Air Force.

Indian Air Force

Air Marshal Sir Thomas Elmhirst, K.B.E., C.B., A.F.C., R.A.F. (Retired), as Honorary Air Marshal of the Indian Air Force, in recognition of his valuable services to that Air Force, which he commanded from August, 1947, until February, 1950.

R.A.F. DELEGATION, GREECE

Air Commodore J. G. Hawtrey, C.B.E., as Head of the R.A.F. Delegation, Greece, and Air Officer Commanding the Royal Air Force in Greece.

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JOURNAL

EDITOR
GROUP CAPTAIN A. H. STRADLING, O.B.E., R.A.F. (RET.)

Assisted by an Air Ministry Advisory Committee of members of the Royal Air Force and Air Forces of the Commonwealth

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EDITOR.

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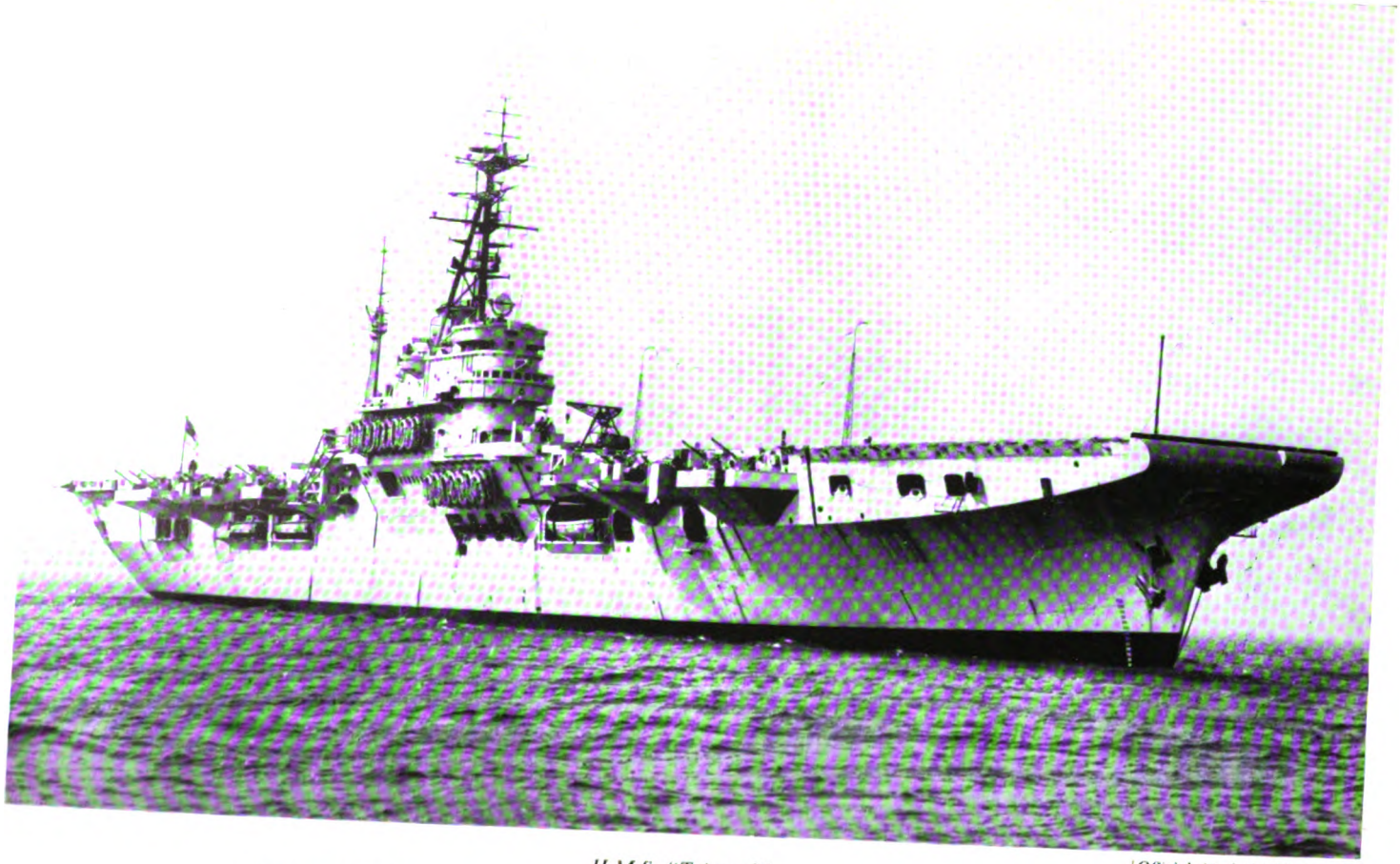

H.M.S. "Triumph" [Official Admiralty Photograph

(See page 115, "Carrier Work in Korean War," by Rear-Admiral H. E. Horan, C.B., D.S.C.)

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EDITORIAL

A NATION DRIFTING

WE drift daily nearer to a new destiny. Great events are likely to happen this year, or in 1952, that will not only affect us as individuals, but the future of the nation and change the accepted conditions of life of all peoples in the world. Will this sadly battered barque "Britain" survive what portends to be the worst storm in her history? Seemingly now drifting rudderless, first to port and then to starboard, but ever in the direction of that black horizon which might be for her the era of a dawnless night.

"Britain," who has so proudly sailed the seven seas, faced time and again fearful odds but remained unconquered, respected and renowned; is she still seaworthy enough to challenge the fates once again by sailing determinedly on her course, even into the fiercest tempest that has ever threatened her? What of the moral fibre of her crew? Are they as dependable as their predecessors whose glorious traditions will last as long as man's understanding of brave deeds remains?

Are the men of Britain today unanimous that it is better to go down with all hands in such a battle, rather than be towed shamefully into the shipbreakers, and then drafted to the galley oars of the enemy?

Such questions do not arise from any source of pessimism, but to those experienced in wars and the preparations for war there are in existence now disturbing factors which give rise to some anxiety.

Among these in the post-war years have been noticed some loss in the prestige of "Service life," the tendency to belittle tradition, the dilution of the strength of discipline, a lack of pride in the noblest of desires "to serve," whether to serve individuals faithfully, or "patriotism" to serve one's country, and, worst of all, a noticeable lack of faith and practice of our religious beliefs, causing a lowering of moral standards. This causes disunity in the crew that would have to man the ship in the coming storm, and our anxiety is further increased by the steady infiltration of communism which is causing so much more disunity among those who would "have to pass the ammunition."

If fight we must, our hope of survival rests upon our unity of purpose, just as much as the seaworthiness of our ship and plenty of arms and ammunition.

A CAUSE TO UNITE US

The need to unite is urgent. Russia has under arms *now* 2,800,000 men (175 active divisions, one-third mechanized) and on mobilization this number can be doubled. She has 25,000 tanks, 19,000 aircraft and about 350 submarines. In addition, she is feverishly rearming her satellites, Poland, Czechoslovakia, Rumania, Bulgaria and Hungary.

For what purpose has this overwelmingly powerful military might been built up? Not to protect Russia against any possible aggressor. There is no nation in the world today who wishes or is likely to wish to invade Russia.

Without using a single Russian soldier the U.S.S.R. has been actively engaged in war against all non-communist countries for several years, employing the new war strategy. By propaganda and psychological means she has been busily undermining the economic and moral stability of her victims (including this country) and this mighty force has been used as a threat to all who oppose her.

A quick survey of the United Nations forces under arms makes it clear that we are not at present prepared to meet a trial of strength in war, but we are

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beginning to resist Russia's psychological attack in Britain and other countries of the United Nations, and with the full realization that if and when the U.S.S.R. realizes that her strategy in this respect is foiled she will use her military might, we are feverishly building up our fighting forces and rearming.

Despite this, it is clear that in many respects we are disunited. Stage one of Russia's strategy has had its effect, which has been briefly outlined earlier in our editorial.

"Class war" has been engendered among us and every opportunity to foster this has been made good use of by our enemies.

Before any material rearmament plan can succeed there must be a change of heart in our people; they must all be convinced of the need for such action and the justice of the cause for which such arms would be used.

Achieve this and the nation will forgo much that will otherwise be demanded: those in industry will not spare themselves in their united effort to produce armaments, the fighting forces will be provided with men enthusiastic in their military training and, should the need arise, "believing in what they fight for and loving what they know," they will face the enemy with the old British unconquerable spirit.

What we need is something to combat the spread of communist ideology in the minds of our people, which is as dangerous, if not more dangerous than the enormous military strength of Russia. We must capture and control the hearts and minds of the masses everywhere.

The answer lies in developing moral rearmament alongside material rearmament. A revival of our Christian way of life would make it clear to all that it has more to offer than communism. The latter materialistic ideology offers little beyond poverty and injustice, subjects the individual to arrest without lawful cause, punishment without trial and forced labour as the chattel of the State. As exemplified by Russia it offers a Police State, violence and the ruthless murder of those who oppose it.

The "Moral Rearmament Organization" which has gone into action against communism in this country is growing in strength and offers the very cause we need to reunite our people. Its principles are worthy of close study and our support, making clear as it does that poverty and injustice cannot be cured by a change of system alone. Human nature must also be changed.

"When everyone cares enough and everyone shares enough, then everyone will have enough. There is enough in the world for everyone's need, but not for everyone's greed."

This growing ideology is practical. It says: "If you want the world to be different, start with yourself, compare your daily living with the moral standards of absolute honesty, absolute purity, *absolute unselfishness* and absolute love" which are the distilled essence of the faith of our forefathers taken from the Sermon on the Mount.

A real revival on these lines backed by the masses has already started. It is spreading slowly, all too slowly, in our hour of peril. We wish it well. Nothing is more likely to reunite our people. It removes class distinction, industrial strife and all those things at the very root of our disunity.

We recommend a study of moral rearmament by every officer and man in the Air Forces. Such books as "Ideological Offensive," by Major-General G. O. de R. Channer, C.B., M.C., or "The World Rebuilt," by Peter Howard, will undoubtedly arouse interest and a desire to know more of an ideology that offers us unity of purpose in these disquieting times.

With a crew so united we could face with more equanimity the gathering storm.

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THE END OF A DREAM

By J. M. Spaight, C.B., C.B.E.

GLOBAL BOMBING

In a speech at a dinner of the American Association for the United Nations at Washington on 29th December, 1950, Mr. John Foster Dulles, the Republican adviser to the State Department, said: "Against such military power as the Soviet Union can marshal, collective security depends on capacity to counter-attack against the aggressor. We have our strategic air force, a stock of weapons, naval power, and potential strength on the ground. Much more of all this needs now to be brought into being. The arsenal of democracy should include all forms of counter-attack. . . . The places of assembly should be chosen not as places to defend but as places suitable for launching the means of destroying the forces of aggression."

Mr. Dulles's speech was in the nature of a funeral oration for a dream that had died. It was a dream that glorified global bombing. Three or four years ago the long-range super-bomber that could take oceans in its stride was loudly acclaimed as the sufficient safeguard of the western hemisphere. Other kinds of armament were virtually written off. They were allowed to run down to a level at which it would have been obviously impossible for the United States to engage in a conflict with Russia, who took very good care not to disarm to any extent that mattered. The result was that, in regard to such other armaments, the United States was in the position of a second-class Power. "Oh, it's all right, we have the big B-36 bomber, and soon we'll have the B-47, and, still more important, the atom bomb": that expressed the common American reaction to this inferiority. "What Russia fears above all else," wrote General H. H. Arnold a year or so before he died, is "our Strategic Air Force, which she cannot as yet match, or as yet understand. In the Strategic Air Force, coupled with our atomic bomb, at this writing we hold the balance of power in the world."[1]

That was all very well, perhaps, so long as the United States had a monopoly of the atomic bomb, but the position became disturbing when it was made known that Russia had managed to achieve a nuclear explosion. Until then the bomb seemed to fulfill in the hand of the Power that stood pre-eminently for peace the function which gunpowder fulfilled in the hand of the king in the Middle Ages, that of a monopolistic weapon by which he could curb the turbulent barons. Now, however, one of the bold, bad barons had it, too, the *neo*-gunpowder, the bomb, and the situation had clearly altered.

THE "BOMBER GENERALS" GO

It had begun to alter, indeed, even before the announcement by President Truman on 23rd September, 1949, that the explosion had taken place in Russia. (He stated a year later, on 23rd October, 1950, that it was the only explosion in that country of which he had heard.) Already the "bomber generals" had begun to be replaced in the United States. It was not, apparently, a complete purge, for much later, on 1st September, 1950, Major-General Orvil Anderson, Commandant of the Air War College, was suspended for saying publicly: "Americans believe in taking the initiative. Give me the order, and I can break up Russia's five atom bomb nests in a week." The project of the strategic air

[1] *Global Mission*, 1949, p. 615.

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[1] *Global Mission*, 1949, p. 615.

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blitz, of a war won almost in the twinkling of an eye without any fighting on land or sea, had begun to be questioned. It was the unexpectedly early development in Russia, however, that inspired second thoughts. The atomic traffic, it was seen, might be a two-way one. The vision of a war conducted by long-range bombers flying the Atlantic or hopping over the North Pole—the latter idea was a particularly popular one—began to lose its attractiveness. It had been a good idea when the strategic charts showed Fairbanks or Anchorage in Alaska as the centre of circles embracing Moscow or other Russian cities. When the centre shifted to Anadyr, in eastern Siberia, or Dickson Island at the mouth of the Yenesei river, and the circle took in Seattle and Chicago and other American cities, the idea began to lose its attractiveness more than ever. It was never a very realistic idea. The raids on the American towns would be, it was suggested, one-way raids, and the Soviet airmen would come down in Mexico and surrender to the authorities there or ditch in the sea near waiting Russian submarines.[2]

On the other hand, the American bombers were expected, it seems, to have sufficient endurance for the round flight. A senior naval officer has told how "painful and distressing" it was to him to listen to "young Air Force Generals" expounding their theory of how the next war could be won by huge bombers which would set out from bases in the United States and return thereto when they had duly deposited their loads on appropriate targets in Russia.[3] It would be as simple as that; too simple, the Admiral thought.

THE NAVY'S CHALLENGE

That was one way in which the United States Navy reacted to the idea of global bombing as a war-winner. There was another which did not display the same shocked incredulity. There might be something in the idea after all, and if there was, the Navy people were not going to be left out in the cold. They, too, must have a hand in the good work. So they began to build a 65,000-ton aircraft carrier from which a giant bomber could take off. At once the Air Force was up in arms against what it regarded as an intrusion upon its own domain. It won the support of the Secretary of Defence, Mr. Louis Johnson, who ordered the building of the big carrier to be discontinued. It was the first time in history, one commentator said, that a flat-top had been sunk by air power before it was even launched.

Ordinarily, however, the view of the naval men was that the doctrine of the air blitz was militarily and morally a pernicious one. To some of them the question was primarily an ethical one, but to most it presented itself as a problem of practical profit and loss. Admiral Arthur Radford told the Armed Services Committee of the House of Representatives at Washington on 7th October, 1949, that the whole plan was a "fabulous concept" which promised the country a short and easy way to victory, whereas in fact there was none. The same committee was warned by Admiral Halsey on 12th October that the enemy would not be stopped by air attacks on his cities, and that if such attacks were made the effect might well be to drive the enemy people to "unite in fiery patriotism." Admiral King told the Committee that the country would be running into grave danger if strategic bombing were allowed to monopolize defence. Some months later, on 15th February, 1950, Mr. Gray, Secretary of the Army, warned the committee that Russia's possession of the atomic bomb must result in increased attention in the West to conventional ground, sea and

[2] Brigadier-General Joseph B. Sweet, *The Price of Survival*, 1950, p. 141.
[3] Rear-Admiral Ellis M. Zacharias, *Behind Closed Doors*, 1950, p. 271.

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air forces. A month or so later the Armed Services Committee issued a report the substance of which was to confirm Mr. Gray's warning. It pointed out that the enemy would not go to war until his supply lines were amply stocked and that mass attacks, whether by atomic or other bombs, on his main centres of production and assembly would have a very limited effect upon his offensive during the critical opening phase of the war.

THE REPERCUSSIONS OF THE BLITZ THREAT

The emphasis placed upon the role of the strategic bomber in western strategy had several important repercussions. In the first place, it increased Soviet misgivings and suspicions about the Western Powers' real intentions. How far the Russians' intransigence and obstruction since 1945 have been due to fear for their own security and how far to a resurgence of Slav expansionism cannot be determined, but there is little doubt that the former motive was at least a contributory factor. Such fear, if it existed, could spring from only one source. Only madmen would think of marching into and occupying Russia's vast domains. She had little to fear from naval assault or blockade. The menace from the West was the menace of the air. Her cities might go up in flames while her land frontiers remained inviolate. There was no lack of evidence that she and she alone was the enemy against whom the West was arming, and that if there was an atomic blitz she would be at the receiving end of it. When General Vandenberg, Chief of Staff of the Air Force, told the Armed Services Committee at Washington on 12th August, 1949, that the B-36 bombers with atomic bombs "in significant quantity" would be able to check any aggressive designs of the Soviet Union, he added that "it was deplorable that they had to think in such terms." It was realistic thinking, however, and everyone knew it.

The effect upon public opinion in the Western European countries was no less disquieting. The strategy contemplated seemed to them to hold out to them only the promise of liberation after the event, not of protection beforehand. What they wanted was to be saved from being overrun. The area overrun, and awaiting liberation, would be vaster than it was in the last war. The Russians, an American military writer has suggested, would sweep across Europe to the Pyrenees, would enter Spain and pass through it to Gibraltar, would probably invade Britain, or, if not, would batter her out beyond recognition across the narrow seas. Britain might be forced, he suggests, to withdraw from the war. All this might happen despite atomic attacks on Soviet centres of production, for the Russians would have taken care to stockpile in satellite territory the supplies needed for the first period of the war. The American counter-offensive, involving a landing in Europe, would not be possible until two or three years after the Russian aggression. Unless that counter-offensive succeeded, a new Dark Age would settle in for Europe.[4] It was a pretty dismal prospect.

ARMY CHIEFS' WARNINGS

The demand of the Western European nations for protection from such a fate could not be regarded as unwarranted. It was reinforced by the warnings of eminent soldiers on both sides of the Atlantic. Field-Marshal Lord Montgomery stated in a speech in New York on 29th November, 1949, to the English-speaking Union: "The point that is fundamental is that a promise to rescue the West in due course after a successful invasion from the East is quite useless. If the West is overrun again, that is the end of the peoples who live there." General Billotte, former French representative on the Military

[4] Brigadier-General J. B. Sweet, *The Price of Survival*, 1950, pp. 147-150, 160.

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Committee of the United Nations, stated in Paris on 8th March, 1950, that "the morale of Western European peoples would be transformed if they could be told that in addition to the indirect protection which the American Strategic Air Force could provide, direct support to match the Soviet menace will also be available, and in time." General Omar Bradley, chairman of the joint Chiefs of Staff of the United Nations, speaking at San Francisco on 19th May, 1950, scouted the idea of the United States pulling back into "the gopher-hole of isolation." "We must propose," he said, "along with our friends in the North Atlantic Pact, to make Europe reasonably secure from being overrun quickly on the ground." The organization that was established for the purposes of the Pact was evidently one intended to enable such assurances to be fulfilled, though whether they will be fulfilled successfully was a question which was open to a good deal of doubt. The pace of the rearmament was a leisurely one.

THE LESSON OF KOREA

The tempo of the defensive preparations against Communist aggression was accelerated after the North Korean invasion of the south. The bearing on the larger problem of the reverses which followed in Korea was the subject of a good deal of discussion in the United States. To Senator Taft, as he explained in his speech in the Senate on 5th January, 1951, the lesson to be learned was that the United States, while not withdrawing into isolationism, should avoid commitments that would involve the fighting of the battle against Communism on the vast land areas of Europe or Asia. She should rely rather on sea and air power, especially for the defence of the "island nations," including Great Britain, Australia and New Zealand, and should undertake operations on the continents of the eastern hemisphere only with the greatest care and subject to the utmost limitation. He seemed, in short, to contemplate the sending to Europe of little more than a token force on the ground. To others the lesson of Korea was about as different as it could be. Senator Connally expounded the opposing view in the Senate on 11th January; it was that air power had been shown to be incapable of stopping the westward march of a huge, well-equipped Soviet force. It was self-evident, indeed, that the undisputed mastery of the air (and the sea) which the United Nations had enjoyed in Korea had not availed to offset the great superiority on the ground of the North Korean and Chinese aggressors. Magnificent work was done by the airmen, both tactically and strategically, and the fruits of it may be still to be picked, but there is no doubt that in Korea interdiction did not achieve the full measure of results which some of us had expected. That, said the advocates of strategic bombing, was because it was not given a fair trial. "We have not been permitted to bomb the real strategic targets, the enemy's real sources of supply," said Major-General Emmett O'Donnell when he relinquished the command of the Far East Air Forces Bomber Command on 16th January, 1951. Be that as it may, the fact remained that for most people the events in Korea seemed to emphasize the need for a strong defence on the ground to cope with an aggressor disposing of powerful land forces. The nomination of General Eisenhower, an army officer, as supreme commander of the North Atlantic Treaty forces, was an indication that this moral had been drawn by the responsible authorities.

THE SHAPE OF THINGS TO COME

So the line of battle has begun to form. There will be riflemen in it still, just as there were in Tennyson's youth. The war, if it comes, will not be so very different from the old war. It will not be the kind of telemachic affair, the affair

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of undiluted long-range bombing, the affair in which the air alone will count and the other arms mere lookers-on, which some of the prophets have foretold. If it were going to be that kind of revolutionized war there would be no sense in the preparations which are being made for it. Clearly the governments of all countries are expecting a war of all arms. That is not to say that the operations in the air will be tactical only, not strategic. There will be plenty of strategic bombing, and it will have a great deal indeed to do with the winning of the war.

In the speech quoteed at the beginning of this article, Mr. John Foster Dulles spoke of the place of the offensive in western strategy. A merely passive defence would not do. He looked forward to the launching of the counter-attack on the forces of aggression from places of assembly suitable for the purpose. What will be the nature of the counter-attack and from what bases will it be launched? A counter-attack on land hardly seems promising; Russia's man power with that of her satellites is likely to be far greater to the end than the Allies', and the vast spaces of the Soviet domains would in themselves rule out a land invasion. Can the counter-offensive be other than one by air? If so, what will be the objectives? Almost the first of all, second in priority only to the enemy's lines of reinforcement and supply for his armies in the west, may be in a region of which little has been said in discussions on western defence and which seems at first sight to have little to do with that defence but has in fact a very definite relation to it.

THE CAUCASIAN OILFIELD

In the last war there was a ready-made and obvious catchment area for the bombs rained on Germany from the west. It was the great industrial region comprising the Ruhr, Westphalia, the Rhineland and other centres not very far to the ast. The factories, railways and oil plants of all this area chose themselves as objectives. We know now from the reports of the United States Strategic Bombing Survey that the most profitable targets were the railways and the oil plants. The raids on the industrial towns, though by no means a waste of effort, were slow in comparison to yield results; German production was actually on the increase up to the middle of 1944. It was the two great campaigns of 1944-45 against transportation and oil targets that made German resistance to the land invasion a forlorn hope. How they were correlated has been well explained by a French authority. Germany, he says, might have fought on longer if it had not been for the air assault on transportation, but, however long she fought, she could never have won because of the other assault, that on her oil.[5] The oil campaign was a nail in her coffin; the transportation campaign hammered it home.

There is in Russia no obvious and accessible area for attack by bombers taking off from western bases. She has, however, a kind of Ruhr which is distinctly vulnerable to air attack from a different quarter, a soft under-belly at which damaging blows could be struck with better effect than if they were aimed at her upper torso. (In war, that would not be "hitting below the belt.") It is the Caucasian oilfield. Its output amounts to more than 80 per cent. of Russia's total production of oil. Losing it, she would lose the hope of victory in a major war. Only a trickle of the precious fluid which is the life-blood of mechanized armies would be left to her. The pitcher would be broken at the fountain, the wheel broken at the cistern.

A massive, sustained, overwhelming attack could be launched against that area from airfields organized betimes on a sufficient scale in the Middle East.

[5] Lieut.-Colonel P. P. C. Postel, *La Bataille Aérienne d'Allemagne*, p. 132.

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The provision of such bases should be a less formidable undertaking in the future than it was in the past. It was pointed out in a recent article in the present journal that caterpillar tracks for undercarriages may do away with the need for the elaborate concrete runways, without which heavy bombers have been unable to operate, and the result should be a great increase of strategic mobility. From such bases in the eastern Mediterranean region there might well be delivered the most spectacular air onslaught in history, surpassing even Operation "Clarion" of February, 1945, when more than 8,000 Allied aircraft attacked Germany's railway system in a single day. Baku, Batoum, Peti, Tuapse, Grezny, Maikop, the whole Caucasian oil region might be turned into a desert and the railways linking them with the north torn to pieces. And powerful defences would not save them. The attack in these days could come out of the blue, unexpected, unseen, could come at supersonic speeds, could strike from baffling heights. It could be as decisive in the final reckoning, and as dramatic, as that turning point, literal and metaphorical, at Jutland when Scheer, hot in pursuit of Beatty and Evan-Thomas, suddenly found himself ringed with fire and the northern horizon lit up by the flashes of big guns that could hit though out of sight, the guns of Jellicoe's battleships racing south in strength from Scapa Flow. That flash-back to war at sea could be followed by another to war on land. There would be opened a possibility of devastation from the stratosphere as momentous in its results as was Sheridan's scorching of Virginia, or Sharman's of Georgia and the Carolinas, or Kitchener's of the Transvaal. These devastations made it impossible for the Confederates in the one war and the Boers in the other to continue to fight. A like fate might be Russia's if the Caucasus became scorched earth, for it is the oil thence drawn that enables her highly mechanized agriculture to be maintained and her granaries to be filled. The effect upon her resistance in the field would be no less disastrous. Her forces would be immobilized progressively as their fuel supply diminished. It would be the most scientific kind of war in these days, the war on logistics. It is that kind of war that can best offset Russia's superiority in man power.

RUSSIA'S POSSIBLE RIPOSTE

But, it may be asked, will not the Russians try to recoup themselves by seizing the rich oilfields of Persia and Iraq? They will try to do so, no doubt, but will first have to overcome a stout resistance by the forty or more divisions which Turkey would be able to mobilize, and by the time they have done that it is to be hoped that the wells and refineries will have been dealt with as Ploesti was in the First World War before the Germans could occupy Rumania. If not made useless beforehand, the oil installations could be put out of action from the air with still greater ease than could those in the Caucasus. They would be a loss, of course, to the western Allies, but it should not be a crippling one. They will still have the immense supply from the Western Hemisphere at their call. The estimated output of North and South America in 1947 was nearly 7,000,000 barrels a day, as compared with 860,000 from the Middle East; Russia's estimated production was 550,000 barrels a day.[7]

THE QUESTION OF NEUTRALITY

In the last war, British (or American) bombers taking off from bases in Cyprus, Egypt or elsewhere in the Middle East would not have been free to

[6] Article by Flight Lieutenant E. Jackson in THE ROYAL AIR FORCE QUARTERLY, January 1951, p. 30.

[7] R. F. Mikesell and H. B. Chenery, *Arabian Oil*, 1949, p. 177.

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fly direct to the Caucasus over the neutral territory intervening. The position would be different now, if, as one must assume at present, the United Nations survive. If Russia engaged in a war of aggression, it could be assumed that the General Assembly would take action under the "Acheson plan" which was approved at Flushing Meadows on 3rd November, 1950, and enables an emergency meeting of the Assembly to be called when the Security Council is prevented by the interposition of a Great Power's veto (as it would be by the Soviet Union's in such a case) from dealing with a threat to peace. Sanctions could then be put in force against the aggressor if voted for by the required majority, and the member states would be bound to do nothing to obstruct them. They would be bound, *inter alia*, to allow passage to aircraft acting under United Nations authority.

Alternatively, and preferably in some respects, a regional security system might have been organized for the eastern Mediterranean, linked with that for the West and embracing the United States, Britain, Turkey, Greece and other countries willing to join it. In that case also no question of neutrality and the consequent refusal of passage would arise. Some such pact is desirable for other reasons also, and it is much to be hoped that it will be set up and the detailed arrangements needed to implement it made in good time. It would be another bar in the dangerous bear's cage.

Whether the general or the regional type of collective security is relied upon to curb aggression in the east of Europe, it is probable that any strategic air action under the one or the other would have to be undertaken largely by the United States. In the nature of things, it would be more effective if bases comparatively close to the objectives were used rather than those of the global bombers across the Atlantic. It is not surprising that the vision of a war decided by long-range operations alone has faded. It need not be lamented. The weight of bombs made possible by the elimination of the fuel load that would be needed for the Atlantic crossing—or for a hop over the Arctic—would amount to a very appreciable augmentation of the hitting power of the great American Air Force. The dreamers should dream again, this time not of the endless leagues of ocean or the frozen north, but of the smiling Aegean Sea and the isles of Greece.

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[Photo: P.A.-Reuter

Typical Korean Country

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AIR ACTION IN KOREA

By Air Vice-Marshal W. M. Yool, C.B., C.B.E.

At the time of writing the intervention of the Chinese forces in Korea has driven the United Nations forces back from the Yalu River to well south of the 38th parallel, and compelled the evacuation of Seoul. What the eventual outcome may be is impossible to forecast, but it seems at the least doubtful whether the Allies will be able to regain possession of the whole of Korea, and that the most that can be hoped for is that the Allies will be able to maintain a defensive perimeter around Pusan. Such a stalemate might well continue for a considerable time, and would be much to the disadvantage of the Allies, although less damaging to their prestige than being thrown out of Korea neck and crop. In fact, it does appear that a satisfactory solution, if to be found at all, can only now be brought about by political, rather than military, means.

Further speculation as to the future course of the campaign is, however, fruitless, and the object of this article is to analyse the influence that air power has so far had upon the operations. Here we have had a situation in which the Allies have so far enjoyed complete air and naval supremacy, although some opposition is now beginning to be put up by the Chinese Air Force, and yet, in spite of this supremacy, the Allies were almost thrown into the sea at the outset of the campaign, and indeed still may be.

The experience of the Americans in the war in the Pacific, coupled with their possession of the atom bomb, undoubtedly helped to colour their views in favour of strategic bombing. They tended to overlook the fact that it can only be fully effective against a highly organized industrial community, with a well-developed system of communications, whose army is organized on European lines, and dependent on the country's industry and communications for its supplies and movement, and that even in Europe strategic bombing had not proved decisive.

The Americans, therefore, gave first place in the post-war reorganization of their forces to the strategic bomber, and, in spite of a violent controversy with the Navy, who attempted to decry the value of the strategic bomber, this policy was adhered to. As a result there were many in the States who imagined that the United States Air Force would finish off the Korean war almost in a matter of hours, without requiring any assistance from the other Services. Things did not happen like that, and the criticisms freely voiced in the early days were twofold, one school bluntly maintaining that the air force had failed, and the other that the cause of failure was that the post-war demobilization of the forces had reduced the air force almost to impotence.

The real truth seems to be that strategic bombing has failed to be decisive, or to exercise any major influence on the operations, not because of inefficiency or lack of strength, but simply because the conditions were not suitable for the effective employment of strategic bombers. Although the main industries of Korea are located in the North, the North Korean Army was by no means largely dependent upon them, or on the scanty communications. Nor did the fact that they received supplies and reinforcements from across the frontier materially contribute to their early successes, or to the subsequent success of the Chinese after their intervention. The success of both forces was due largely to their loose tactical organization, which enabled them to move freely across country, independent of the roads, and their ability to live largely on the country.

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The Americans, on the other hand, seem to have been bogged down by their own efficiency in supplying and moving their troops. There was such a superfluity of transport and supplies that the troops seemed to be incapable of operating without it. The North Koreans took full advantage of this weakness, and most of the early withdrawals were forced upon the Americans by the infiltration of the enemy behind their lines by crossing hill ranges that were considered impassable, and were consequently undefended. At the same time there is no doubt that the North Koreans were extremely well led. Their higher organization was efficient, they fully realized their own limitations and those of the Americans, and made the best use of the forces available. Even after their communications had been cut by the Inchon landing the command continued to function effectively, and to maintain some form of control over its formations. As a result, although they suffered heavy losses, they were able to withdraw a large proportion of their forces across the Yalu River to the sanctuary of Manchuria. There they regrouped and advanced again in strength with the Chinese forces when they launched their offensive.

The United States Marines, on the other hand, were organized on much more mobile lines than the Army, and the fact that they were more successful was due largely to their independence of the roads and valleys, and to their ability to move freely across country. They were thus able to fight the North Koreans and the Chinese on their own terms. This was well exemplified by their advance after the Inchon landing, and by the magnificent withdrawal of the Marines, together with the X Corps, through the port of Hungnam, in face of the strong Chinese attacks.

Another fact that increased the early difficulties was that the American preoccupation with strategic bombing had apparently led them since the war to neglect the development of tactical air forces. Better air support, although it would not have provided the whole answer, would undoubtedly have helped to some extent to overcome the lack of mobility on the ground. Here again the Marines were better off in that they had their own aircraft under their own control. This is not necessarily an argument for giving the army also its own aircraft, as has been suggested in the States. It is very easy to make false deductions as to the use of air power from the campaign in Korea, and it must be remembered that there was no struggle for air superiority, which, where there is strong air opposition, has first to be obtained before adequate air support can be given to the ground forces.

That this lack of air support was a weakness in Korea appears to have been fully realized. Last November the Defence Department issued details of a reorganization of the United States Air Force under which there are to be three Commands of equal status in the States, each reporting direct to the Chief of the Air Staff. At the same time it was announced that this reorganization was required partly to meet the needs of the expansion programme, and partly to provide for the more effective employment of tactical and air defence units, as the experience gained in the Korean campaign had shown that changes should be made in the training methods for air co-operation with ground forces.

By the time of the Inchon landings on 14th September the early weaknesses in tactical air support had been largely overcome, and the brilliant success of this operation, followed by the rapid advance to the frontier, led to the mistaken belief that all our troubles were over, and to General MacArthur's unfortunate "Home by Christmas" message to the troops. For the moment it did look as though the machine, in the shape of the enormous industrial resources of the United States, was going to overcome the man. Masses of ships (over

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250 were used for the Inchon landings), tanks, aircraft guns, transport and supplies of every description were poured in, and the Allies swept triumphantly forward to the Yalu river. But there disillusion awaited them, as it became evident that only the first, and less serious, phase of the war had ended. A large part of the North Korean Army was still intact, and facing the Allies across the river. At the same time the build-up of the Chinese forces made it evident that intervention by them on a large scale was imminent.

Following the opening of the second phase with the Chinese offensive, the Allies have again had practically complete air and naval supremacy, although there has been some slight Chinese air opposition. This supremacy enabled the X Corps and the Marines to be withdrawn through the port of Hungnam, but by and large air power once more does not appear to have had much influence on the course of the operations. The reasons for this appear to be partly the almost limitless man power of the Chinese, who press on regardless of losses (one pilot reported that the Chinese did not bother even to take cover, but just kept marching over the bodies of their dead), and partly the absence of suitable or worthwhile targets for air attack.

The Chinese forces, like the North Koreans, rely for their success on mass infiltrations behind the Allied lines, using the hills for movement, whilst the Allies are still largely road-bound. At the same time the Chinese have little wheeled transport and no highly organized system of supply and communications. They have few guns or tanks, and their troops live mainly off the country, where the autumn harvest of rice is readily available to them. Nor are the rivers any great obstacles during the winter, as they are frozen over and can be crossed freely in most places. Air support, therefore, consists largely of direct attacks on the Chinese forces, but such attacks obviously cannot be decisive against troops employing the infiltrating tactics of the Chinese, and who have unlimited man power available to replace losses.

No accurate estimates of the numbers involved have been given, but 200,000 was quoted for the original attack across the Yalu, and since then the estimates issued by General MacArthur's Headquarters of the numbers massing for any big attack have generally been from 200,000 to 300,000. It seems, therefore, that the Chinese, together with the North Koreans, may well dispose of some 500,000 or more men, with further large reinforcements readily available across the frontier.

Against this, when the Chinese offensive opened, the Allies had some seven United States divisions, several South Korean divisions and the various Allied contingents, making in all a force of about 200,000 men. In addition there were several thousand South Korean police and a large number of partisans organized for work in the rear areas. On the face of it the disparity in numbers did not appear to be such that the Allied superiority in fire power, armour and aircraft would not more than counter-balance the greater numbers of the enemy, but the fact remains that so far the Allies have had to withdraw every time the Chinese have attacked in force.

There is one other aspect of air power that should be considered, namely, the question of whether the atom bomb should be used. When the United Nations forces had reached the Yalu, and it became obvious that the Chinese were massing for an offensive, there was an outcry in the States for the use of the atom bomb, whilst at the same time there was a large body of opinion in Asia in particular, but also in some quarters in this country, which considered that the atom bomb should not be used in any circumstances. Such a view may be illogical and founded on sentiment rather than reason, but it is clear that political con-

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siderations cannot be ignored in deciding whether or not to use the bomb, and that the military reasons for its use would have to be very strong indeed to justify any decision to use it. Such military reasons do not exist in the Korean campaign, as there are no industrial targets or enemy bases that would justify the expenditure of the industrial effort represented by an atom bomb, and concentrations of enemy troops—even if they could be attacked without danger to our own forces, which is likely—can be attacked as effectively with normal weapons. Similarly, even if General MacArthur had been authorized to take limited action from the air against targets across the Manchurian frontier, it is very doubtful whether there are any targets in the area that would justify the use of the atom bomb. Such attacks across the frontier would have been confined mainly to the Communist communications, supply depots and troop concentrations, with the object of interfering with the movement of reinforcements and supplies to the front.

In this connection the views of Major-General O'Donnell, who was in command of the Far East Air Forces Bomber Command up to the middle of January, are interesting. On relinquishing his command he was reported in the Press as saying: "With the 43,000 tons of bombs we dropped we have done all the major damage in Korea. They have not got a single refinery left. They have no chemical potential, and their transport system is completely shot. The mission of strategic bombing is to destroy the economic health of the enemy. We have done that, as far as North Korea is concerned, although the country did not have much economic health to begin with. We have never been permitted to bomb what are the real strategic targets, which we are extremely capable of doing, and it is ridiculous to sit down and blame us for reverses in Korea."

The same view was voiced by General Vandenberg, the Chief of Staff of the United States Air Force, during his visit to Tokyo in January, who said that strategical bombing of the enemy's bases would be the most effective way of dealing with the present situation, but one is left with an uneasy feeling that the bombing or such targets would not, in fact, materially affect the course of the Korean campaign, apart from the other implications that cannot be ignored.

Many students of war are now claiming that the main lesson of Korea is to prove the dominance of the infantry soldier, when unencumbered by equipment and able to take full advantage of his natural mobility. This may be true in Korea, but does not necessarily help to provide the answer, as obviously the United Nations could not hope to match the Chinese forces man to man. If a solution cannot be found in a combination of fire power and mechanization with mobility, the outlook in Korea is bleak, but the campaign should at least help to bring home the lesson that wars cannot be fought on preconceived lines, because the enemy is unlikely to be obliging enough to meet your views. It is no use pinning one's faith to the strategic bomber for a war in Korea, or to the foot soldier for an anti-submarine campaign. What is required is balanced forces, organized as far as possible to meet all likely contingencies, in the certain knowledge that no two wars are alike, and that there is no ready-made solution to be found in advance.

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CARRIER WORK IN THE KOREAN WAR

By Rear-Admiral H. E. Horan, C.B., D.S.C.

(The author is indebted to Captain A. D. Torlesse, D.S.O., R.N., Commanding Officer of H.M.S. "Triumph," for all data supplied for this article)

As is well known, the North Koreans invaded Southern Korea on 26th June, 1950. This came as a bolt from the blue. This act of unprovoked aggression was duly noted as such by the United Nations Organization, and the United States forces on the spot at once swung into action.

The light fleet carrier H.M.S. *Triumph*, a unit of the China Squadron, had been cruising and exercising in Japanese waters for a period of three months on that date and was on her way to Hong Kong. The thoughts of all on board were far from warlike. The ship was due for a long refit at Singapore, after which she was to return to England when the *Theseus* arrived as her relief.

Thus we find the *Triumph* with her attendant destroyer the *Cossack* steaming towards the Korean Straits on the date in question. Within the next twenty-four hours it became obvious from intercepted signals that stern business was afoot. Early on 27th June both ships were placed at the disposal of the United Nations Command. The first thing to be done was to fill up with fuel, stores and provisions, as these had been let run down in preparation for the refit.

On the morning of 28th June both ships arrived at Kure, and being complete in all respects sailed at daylight on 29th June to join the flag of Rear-Admiral Andrewes, Second-in-Command of the Far East Station. At 1600 hrs. on that date the *Triumph* found herself in company with the *Belfast* (Flagship), *Jamaica* and *Consort*, and the whole force shaped course to join the U.S.A. Squadron under Vice-Admiral Struble, U.S.N. This junction was effected next morning, 30th June. On passage anti-submarine patrols were flown by *Triumph's* aircraft.

It is most interesting to see how smoothly and efficiently peace routine becomes war routine in the Royal Navy.

OPERATIONS

On joining the American Squadron our force found that it consisted of the heavy cruiser *Rochester*, the large aircraft carrier *Valley Forge*, and five destroyers. At once plans for concerted action were put in train.

This was greatly facilitated by the fact that ships of the U.S.A. and British squadrons had exercised together frequently, and as far as signals were concerned talked the same language.

The *Valley Forge* was equipped with eighty aircraft. These included Panther (jet) and Corsair fighters and Skyraider dive bombers—a formidable force.

As a first operation it was decided to attack targets on the west coast of Korea, so at daylight on 3rd July the whole force was off Inchon and the first strikes were made. The objectives included airfields, railway targets and factories.

The operation was repeated the next day but results were, on the whole, disappointing. No enemy aircraft were sighted and movement by rail was scarce. Also the North Koreans were masters of concealment and camouflage, so targets of opportunity were conspicuous by their absence. So combat and anti-submarine patrols were flown, as was the routine for all operations.

It is interesting to note that two of the American ships were supplied with

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Rear-Admiral W. G. Andrews, C.B., C.B.E., D.S.O., Captain A. D. Torlesse, D.S.O., R.N., Commander M. Bruce, R.N., and Lieut.-Commander G. H. Creese, R.N., discussing a future operation in the Operations Room, H.M.S. "Triumph"

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helicopters which were most useful as "planeguards" when flying operations were taking place. On one occasion one of their aircraft went over the bows of the carrier into the "drink" and the helicopter had picked up the pilot almost before he was clear of the ship's stern. Another example was when one of the helicopters had an engine failure and fell into the sea. The other helicopter was on the flight deck of the *Triumph* with the engine stopped. It was off within two minutes and rescued both men from the "ditched" machine, one at a time, within ten minutes.

FUNCTIONS OF AIRCRAFT

During subsequent operations, which generally followed the lines already described, the roles of our aircraft and the American types became more or less stereotyped. Owing to their shorter endurance our aircraft were usually employed on combat and anti-submarine patrols, while the Americans concentrated on the "strikes." This worked very satisfactorily but deprived our personnel of some of the excitement.

AMPHIBIOUS OPERATIONS

The rapid advance of the North Korean forces down the centre of Korea and the subsequent retreat of the United Nations forces during July produced a very anxious situation. The port of Pusan on the south-east coast of the peninsula was gravely threatened. This was the only port which could be used for keeping the forward troops supplied.

The U.N. High Command therefore decided to stage an amphibious operation with the object of getting behind the North Koreans and threatening the supply lines. The spot chosen for this was the small port of Pohang on the east coast of the peninsula. On 18th July we find the *Triumph* taking part in this. When this was successfully completed the combined fleet went north up the east coast to carry out "strikes" against the ports and industrial areas in the region of Wonsan. It was while on this job that the Sea Otter (amphibian) from the *Triumph*, carried for rescue purposes, came into her own. A Corsair "ditched" some eighty miles from her carrier. The Sea Otter effected a most timely rescue under most exacting conditions.

On returning from the above operations the combined fleet thought they were due for a rest. Not a bit of it. Hardly had they got into harbour and completed with fuel, stores, etc., than orders came from Tokyo for another operation.

The North Korean forces had overrun the south-west corner of the peninsula. In company with two newly arrived U.S.A. carriers we find the *Triumph* supporting the American Marines in their efforts which eventually stopped the rot.

Here again the value of carrier-borne aircraft was once more demonstrated. It must be remembered, however, that there was no question of who had command of the sea in the Korean operations, and for that matter the air as well.

BLOCKADE DUTIES

The west coast of Korea, with its many islands and difficult navigation, lends itself to ships and craft, manned by men with local knowledge, to blockade running. In spite of the fact that the U.S.A. Air Force kept up a vigorous offensive against the enemy lines of communication on land, supplies were getting through. It was obvious that this must be happening by sea. So we find a Commonwealth Force under Rear-Admiral Andrewes being formed with the object of stopping this traffic.

Triumph's aircraft were most useful in keeping observation along the coast and destroying blockade runners. This was not as easy as it sounds. On the

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[Official Admiralty Photograph

THE LANDINGS AT INCHON
Photograph taken by aircraft from H.M.S. "Triumph"

[Official Admiralty Photograph

THE LANDINGS AT INCHON
Photograph taken by aircraft from H.M.S. "Triumph"

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coast in question the rise and fall of tide is some thirty feet, so craft that were sighted on one sortie might well be high and dry when the next sortie was in their vicinity. Added to this, the North Koreans were adepts at camouflage. These difficulties were largely overcome by always using our aircraft in pairs and giving them orders only to attack after the most careful examination. Of course, anything that was obviously disguised was always fair game. There seems no doubt that this use of aircraft was effective in interfering with the enemy's supplies.

THE LANDING AT INCHON

During the month of August the *Triumph* was fully employed on these blockade duties. Sometimes an operation on the east coast with the American forces provided a break.

All this time the U.N. Command was making ready for the landing at Inchon. This was a most bold move and involved great risks. Any amphibious operation requires the most careful planning and preparation. Both these phases were greatly helped by the fact that General MacArthur had actually in Japan not only sufficient forces and craft but also a properly formed Combined Training Establishment.

History will no doubt record how, in such a short space of time, this large combined operation was got ready. At any rate it was formed, trained and at sea by 13th September. *Triumph* and her aircraft were part of the escort to the great armada as it sailed up the Yellow Sea.

Finally, on 15th September, at first light, a force of the U.S. Marines landed on the island of Wolmi, which is the key position of the Inchon harbour defences. This operation was a model of its kind. Under an intense bombardment, in which *Triumph's* aircraft spotted for our cruisers, the landing took place and the attackers suffered practically no casualties. All day long the bombardment was kept up on the enemy positions, and at 1700 hrs. the main landing took place on a wide front. The invading forces were well established by dark.

During the next few days *Triumph's* aircraft were continually employed on spotting for our ships. The most spectacular success during this bombardment was when the *Jamaica* touched off a large ammunition dump in the town.

To enliven the proceedings, two Yak aircraft appeared and attacked the ships. One was promptly shot down by the *Jamaica*.

CONCLUSION

After three months' continuous operations, i.e., at the end of September, the *Triumph* was relieved by her sister ship the *Theseus*. When this took place the former's aircraft were just about on their last legs. But right to the end operations were being carried on.

A few statistics will show just what was done in the period under review. The ship steamed 18,500 miles and her aircraft carried out 895 sorties. Over 1,500 rockets and 50,000 rounds of 20 mm. ammunition were expended.

As the result of her activities 71 coastal craft were destroyed and the damage done to airfields, hangars, railway installations, bridges, gun emplacements, factories and store dumps cannot be assessed.

The value of having a fully equipped highly mobile airfield in the war zone, such as a carrier represents, is clearly shown. Further, by having a carrier on the spot, the time for "briefing," providing immediate support and engaging opportunity targets is, of course, greatly reduced.

The way in which all naval units of the many powers engaged worked together augurs well for the future.

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[*Photo: Fairey Aviation Co. Ltd.*

ANTI-SUBMARINE AIRCRAFT OF THE ROYAL NAVY

The new Fairey "17." It is what the Americans call a "single packet" aircraft, combining the duties of a radar search and a strike aircraft, carrying a wide variety of offensive weapons. The "Double Mamba" twin co-axial turbine engine gives the aerodynamic advantages of a twin-engine performance from a single installation. The radar "dustbin" is lowered and its bomb bay open. Dimensions are : span 54 ft. 4 in., length 43 ft., height 13 ft. 9 in. The aircraft can be flown with either of the co[illegible]

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SEEKING SUBMARINES AND ECONOMY—ROUND TWO

By John W. R. Taylor

TWICE in the past thirty-five years this country has been brought almost to its knees by enemy submarine blockade, and we must never lose sight of this fact, even in an age of atom-bombs, jet-planes and "push-button" weapons. The much publicized Russian intention of building up by the end of this year a total of 1,000 operational submarines—a fleet 17½ times as great as that with which Germany entered World War II—shows that the war-winning capabilities of the submarine are well known to our only potential enemy.

It is easy to underestimate the menace of such a force, for we have been told many times that Hitler's U-boats were beaten by Coastal Command or the Royal Navy, by flying-boats, frigates, corvettes, V.L.R. bombers, Leigh-lights, rockets, or one or another of a score of defensive measures. *The cold, hard, unpleasant truth is that the U-boat was never beaten in World War II.* The skill of our scientists and designers, the courage of our sailors and airmen ensured the temporary eclipse of Germany's underwater flotillas during the invasions of North Africa in November, 1942, and Normandy in June, 1944. But in the last two months of the European War, when the Wehrmacht and the Luftwaffe were smashed and ineffective, German U-boats sank no fewer than forty-four Allied merchant ships, many of them in waters apparently dominated by Allied aircraft and surface vessels. Had the war continued, new fleets of high-speed, *"schnorkel"*-equipped U-boats, firing radar-directed torpedoes, might well have wreaked more havoc among our convoys than did their predecessors in the grimmest months of 1942.

We can be certain that Russia has taken full advantage of every German advance in submarine design and warlike efficiency, and that, consequently, the submarines we should have to fight in any future war would not be of the sort we subdued in 1944, but improved versions of those that gained the upper hand over our counter-measures in 1945.

Nevertheless, we cannot afford to ignore completely the lessons of 1939-45; in particular, we should remember that, of the total of 781 U-boats destroyed, nearly one-third were sunk by carrier-based aircraft and by R.A.F. Coastal Command, whose "ace" U-boat killer was the Sunderland flying-boat. This fact is interesting, because proponents of all-out air power have never ceased telling us since the war that both the flying-boat and the aircraft carrier are vulnerable, obsolete weapons in this atomic age. Nor has this advice been cast aside, apparently, for most of our carriers were put into "mothballs" after the war and the veteran Sunderlands of Coastal Command are being replaced by squadrons of Shackleton land-based bombers.

In his article *"Seeking Submarines—and Economy,"* in the January Royal Air Force Quarterly, Squadron Leader B. W. Parsons pointed out the tremendous superiority of the flying-boat over the land-based bomber for anti-submarine work. His arguments were logical, convincing and so sound that it is impossible to believe that they are not equally obvious to the Air Staff. Present apparent lack of official interest in a Sunderland replacement is not only regrettable but tragic.

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[*Official Admiralty photograph*

Another picture of escort carriers in heavy weather. In this case they have Sea Hurricanes on deck. Being "panic conversions" of land-based fighters, necessary because development of naval types was neglected pre-war, these had fixed wings and had to remain on deck in such conditions. The Swordfish, designed for naval work, with folding wings, were stowed below, where they could be protected and serviced at all times. Nowadays, naval fighters like the Seahawk are equal in performance to their land-based counterparts, despite folding wings, etc.

[*Crown Copyright*

Typical of the conditions in which Swordfish anti-submarine aircraft (in this case with rockets) were able to operate from escort carriers during the war. Could a big aircraft fly 1,500 miles to find and protect a convoy in such weather?

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Squadron Leader Parsons' arguments against the aircraft carrier were less convincing, and follow the usual line adopted by present-day critics of sea power. With New York only 18 hours from London, and Australia about four days away, the oceans seem to have shrunk to mere fishponds, and the idea of a carrier plodding along at 30 knots, looking for a U-boat, must seem ludicrous to the airman in his 300 m.p.h. bomber. But such thought is dangerous, for, despite every device of modern submarine-hunting, the task of finding a small submarine in a very big ocean is still incomparably harder than locating the proverbial needle in a haystack. The job was simplified a little in the last war when German U-boats had to pass through the Bay of Biscay or northern waters to reach their killing zones, so that we were able to concentrate our airborne counter-measures in those regions. Unfortunately, Russia would not be restricted to one or two main gateways to the high seas, and it would be completely impracticable to scour the whole ocean for submarines. In *The World Crisis*, Winston Churchill has given a graphic description of the immensity of the seas that would have to be searched:

> "The map of the world in the Admiralty War Room measured nearly 20 feet by 30 feet. Being a seaman's map, its centre was filled by the greatest mass of water on the globe—the enormous areas of the Pacific Ocean filling upwards of 300 square feet. On the map, the head of an ordinary veil pin represented the full view to be obtained from the masts of a ship on a clear day."

Systematic search of the whole sea area of the world is obviously out of the question. Fortunately it is not necessary, for submarines are dangerous only when in a position to attack, and the most important place to hunt and destroy them is therefore within striking distance of convoys.

Let us now consider the plight of a convoy in mid-Atlantic, about to be attacked by a "wolf-pack" of submarines. It will probably cover an area of two or three square miles in 31,530,000 square miles of sea. Is it then practicable to send out either flying-boats or landplane bombers to find and protect that convoy, perhaps 1,500 miles away in bad visibility? Or would it be preferable to provide the convoy with an escort of two light carriers, from which specialized hard-hitting anti-submarine aircraft like the new Fairey "17" could take off and smash the attack?

Which is the more economical—a 3,000-mile round flight by four or eight-engined flying-boats, each with a crew of eight, or a 100-mile search and strike by twin-engined, three-seat carrier planes? Furthermore, there is no reason why many of the escort carriers should not be of the MAC-ship type, with a flight deck superimposed above a hull-full of wheat, oil or munitions. Such ships would be no more vulnerable, little more costly and far more useful than any other merchant ships in the convoy.

So, acknowledging the flying-boat to be infinitely superior to the land-based bomber for lengthy patrol sorties in home waters, it seems that the ideal, economical anti-submarine force should consist of home-based flying boats and carrier-based "single packet" search and strike aircraft. We already have the latter in the Fairey "17." We must hope, like Squadron Leader Parsons, that the appearance of a new flying-boat to replace the superb, but ageing Sunderland will not be long delayed.

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[Photo: Air Ministry

AIR MARSHAL SIR HUGH P. LLOYD, K.B.E., C.B., M.C., D.F.C.
Air Officer Commanding-in-Chief, Bomber Command, Royal Air Force

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FAMOUS AIRMEN

AIR MARSHAL SIR HUGH P. LLOYD, K.B.E., C.B., M.C., D.F.C.

BY KENNETH HARE-SCOTT

IN 1914 a handful of young men who had experienced the thrill of travelling on two wheels at 30 or even 35 m.p.h. joined up in the Royal Engineers. Taking their own motor-cycles with them, they became Corporal Dispatch Riders. Typical of their breed in that hour, they were out for speed, adventure and come what may. One of them, Hugh Lloyd, was still in his teens. Another, Sholto Douglas, was a little older, and there were others, too, whose fame is our pride today. But it is about Lloyd, now Commander-in-Chief of Bomber Command, that I have chosen to write, because he occupies a key command in the structure of Western Europe; and for the equally good reason that he is well worth writing about.

The First World War brought Hugh Lloyd a crop of wounds early in 1915, a short-lived trip with his motor-cycle to Gallipoli, a commission in the R.F.C. in 1917, adventures galore over the Western Front, the M.C., D.F.C., Croix de Guerre, and promotion up to the rank of Major. Of those early flying days he says: "We learned our flying at Castle Bromwich, just clearing the factory chimney there in the same time as today would see you up to 15,000 feet. We had never a dull moment."

After the war he commanded a squadron for a while and then went off to India for five years' frontier operations which gave him about the only bombing experience to be had in the world at that time. When the first list of Regular commissions in the new R.A.F. was published, twenty-five or thirty names in all, he was there as a Flying Officer, in the company of other proved warriors of the air and that notable figure, the "father" of the R.A.F., now Lord Trenchard.

From India he passed through the Staff College, and then back to "school" in a Training Group, where "we were *taught* to fly for the first time, taught what an aeroplane was all about, why and how things happened. And then we got down to the job of teaching others." He soon became Chief Flying Instructor. A senior R.A.F. officer who knows him well told me: "His knowledge of everything to do with aeroplanes is remarkable. He understands not only how to work the instruments, but why and how they all work. He is a superb pilot." Never, since the earliest days, has he flown less than 100 hours a year, often much more; he is classified as an A.1 pilot, and he showed me his coveted "green card" entitling the holder to fly in all weathers. As Commander-in-Chief he pilots himself on tour around stations of his widespread Bomber Command.

In 1930 he returned to India, now a Squadron Leader, for more frontier work and to instruct at the Staff College. Hunting had always been a passion with all his family, and he is very proud of having been the only airman to be Master of the Peshawar Vale Hounds, the richest and most popular hunt in India, founded as long ago as 1868. His wife, equally enthusiastic, was his second whip.

Six years later he became an instructor at the Staff College, Camberley—"the one redeeming feature, I had all the horses I wanted. The Services got on well together, but we, in the R.A.F., had to fight like the devil." In January, 1939, like most realists who lived outside the Whitehall fog, Hugh Lloyd saw what was coming. Joining Bomber Command, he gave up his horses and got down to

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work. The first squadron of Wellington bombers was his for a while; then, promoted to Group Captain, he commanded a station before becoming, in February, 1940, a staff officer on operations and plans at Bomber Command Headquarters. Now the sun really broke through the clouds for Lloyd. His association with his Commander-in-Chief, Air Marshal Portal, now Marshal of the R.A.F. Lord Portal of Hungerford, was happy, and the first twist of fortune came within a few months when he was appointed Senior Air Staff Officer (S.A.S.O.) to a Bomber Group. There he became immersed in Bomber Command's part in the Battle of the Low Countries, Dunkirk, and the Battle of Britain, when Bomber Command lost in aircrews just under double what Fighter Command lost. It was tough going, but the courage of those far-off days of the R.F.C. lived again in that epic year; ultimate victory seemed that much more secure as the bombers struck at the enemy's concentrations, his shipping, at his every preparation to invade us.

In 1941 came Lloyd's second twist of fortune at Portal's behest. Malta was besieged. Her spirit was undaunted, but material factors pointed to the urgent need for strengthening her air striking power, sharpening her blunted sword. "Will you go to Malta as A.O.C., Mediteranean?" came a voice through the inter-communication set linking Air Ministry to Bomber Command H.Q., where Lloyd was attending a conference. "Yes, sir." And in those few seconds the Group Captain became an Air Vice-Marshal (thus he jumped the rank of Air Commodore). A few hours to pack, bid farewell to his wife and daughter, and the perilous flight by Sunderland flying-boat began.

At Gibraltar he met Gort, later to be Governor of Malta and associated with Lloyd in part of the island's glorious phase of offensive action. As the Sunderland swept in to land on the sea beside Malta, the career of the new A.O.C. nearly ended abruptly. "The direction of alighting was towards the island and our pilot overshot three times and went round narrowly avoiding the high ground on each occasion. When we did alight the aircraft was swung so violently to miss a rock that all the passengers were thrown into a heap and battered in the process, all the crockery was broken and a wing float torn off. . . . I only bumped my nose."

Lloyd has become one of the legends of besieged Malta. On the tiny, rocky island, pock-marked with bomb craters, he built up an Air Force of bombers and fighters which, with the Navy's submarines (we must never forget such heroes as David Wanklyn, V.C.), destroyed hundreds of thousands of tons of Axis shipping—Rommel's much-needed supplies. I do not exaggerate in saying that just as remarkable as were Malta's endurance and fortitude was the war of aggression waged by the R.A.F. and Navy in the air and under the sea with fantastically inadequate resources, few, if any, "spares," the odd spanner, and a ball of string to tie bombs under the two "Maryland" observation planes! Lloyd's vivid account of it all in his book, "Briefed to Attack," is well worth reading. It reveals the man as an indefatigable worker, revelling in his problems, brim full of praise and admiration for his gallant aircrews, applauding their successes, deeply sorrowing in their tragic and heavy losses. "To every one of those volunteers the sinking of ships was their crusade, and without any doubt they were knights of St. John—the modern Crusaders," he says.

By September, 1942, the crisis had passed, and Lloyd left Malta to become S.A.S.O. to Sir Arthur (now Lord) Tedder, Commander-in-Chief of the Allied Mediterranean and North African Air Forces. A C.B.E. of the previous year was now advanced to a knighthood in the same Order. Thereafter his responsibilities grew with the hour. The Air Command had, as he put it to me, "a parish

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from Benghazi to Crete," and the team was one-third each British, American and French. They covered seven invasions, protected convoys, and looked after the air defence of all North Africa. Again, never a dull moment for him.

In 1944 he came home to organize the British Commonwealth Heavy Bomber Force ("Tiger" Force) of which he became Commander-in-Chief as an Air Marshal. The Corporal Dispatch Rider had travelled far and at speed. In the next year he was off to the Far East—"the Japs knew Bomber Command were coming, so they gave up!" he will say, with a merry twinkle in his eye. The Command's plan to sever the island structure of Japan by destroying its bridges and tunnels between the islands was about as complete as anything yet conceived.

After the war Lloyd spent two years at the Imperial Defence College as deputy to Field-Marshal Slim, becoming, for the next two years, Commander-in-Chief in the Far East, with H.Q. in Singapore and a "parish" extending over Hong Kong, Siam, Formosa and the N.E.I. "I loved it," he says. And he made a close study of the Communist dangers and tactics, forecasting much of what has lately happened.

Today Bomber Command has a Chief, still in his very early fifties, who is surely in line to command the Allied Bomber Forces of the West. He possesses —and those around him will confirm it—unusual qualities. He is a powerful and efficient administrator, a brilliant organizer; he is superbly knowledgeable in technical matters and a great pilot, both qualities which win the respect of flying men. He can be firm, is direct in speech, keen to grip the essentials of a problem. Socially he has great charm, tact and tolerance, and is interested in the affairs of others. With him and his family I recently attended a farewell cocktail party given by an American officer and his young wife after a spell with Bomber Command. The Commander-in-Chief had the warmest possible greeting from his young hosts, as indeed he did from all present, great and not so great; for Hugh Lloyd is sought out on such occasions for what he is, a family man interested in a host of subjects with, of course, flying as number one.

I was a soldier during the war, admittedly (and sometimes reluctantly!) airborne during the final eighteen months, but I had always had a sneaking ambition to see the Headquarters from which the great bomber offensives that so effectively softened our military objectives were conducted. As I sat with the Air Marshal in his office, I felt the exhilarating atmosphere of the place, the history now associated with a modern building of bricks and mortar, a "quadrilateral" mound denoting the underground "ops" room down the pathway, the "parking" and other signs, the designations of those within written upon each door, the surrounding green fields, the distant houses which had been families' billets during the war. All nothing to look at really, but, as I have said, steeped in war-time history—a scene of perpetual memories for many.

I think the Commander-in-Chief feels it, too. He talked with pride of his predecessors, of incidents he recalled as a staff officer in those momentous years. "I was standing at this very spot in the room in 1940 when . . ."; or, again, "See that path through the window, down there? Portal and I were walking down there towards the 'ops' room one day when he turned to me and said. . . ." And so on.

If enthusiasm for his calling, technical attainment, administrative efficiency and a sense of responsibility fashioned with the best sort of pride count for anything in this world, Bomber Command has a Commander-in-Chief today who is a worthy successor to the great names that have gone before him.

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THE EFFECT OF AIR POWER ON SEA COMMUNICATIONS

By Thomas Milne

FEW will dispute the statement that the history of the last war fulfilled General Smuts's prophecy in 1917 that "Air supremacy may in the long run become as important a factor in the defence of the Empire as sea supremacy." Indeed, if the modern phrase to describe the situation envisaged by General Smuts, *air superiority* is substituted for air supremacy, the statement might well form the basis for the planning for the defence of the sea communications between the various members of the Commonwealth, as it might well have done in the preparations for the Second World War. But habits in defence are as difficult to change as traditions in foreign policy, and sea power, exercised as it had been for over a hundred and fifty years, remained the cardinal doctrine in our measures to safeguard our sea communications. Sea power—or the meaning that is generally given to that phrase, viz, the ability to keep open those sea routes which a country deems essential to its well-being in time of war, and to deny the use of such routes to an enemy—is still indispensable to our very existence. But the experience of the last war has made it plain that the character and type of forces necessary to exercise that command have changed.

Mahan made plain for those who cared to read what were the principles of sea power and the essentials of naval supremacy. No one as yet has done the same for air power, perhaps because it is still in a state of flux; the weapons of air power have not reached the same degree of finality as most naval weapons. Yet the fact remains that the successful exercise of air power, i.e., the winning and keeping of air superiority, is an "indispensable pre-requisite of all war-winning operations." The lesson of the Second World War was that before success could be achieved in any sphere of major operations, a situation had to be created where the enemy air force could not interfere effectively with our operations. There is, however, no apparent formula to obtain air superiority; no set of rules, which, when applied automatically, bring about the desired result. There is nothing absolute about it, as the destruction of the enemy fleet is in the naval sense, so long as the enemy has any aircraft which he can operate effectively. A numerically larger air force does not mean eventual victory, even by a process of attrition. The winning and keeping of air superiority is in fact the continuous process of air warfare in all spheres, in the air, on land, or at sea. Yet the effects of its possession or lack of it are easily discernible in the course of the Second World War.

The hoary old music-hall joke that the United Kingdom always prepares for the last war has a good deal of justification. The lessons of past wars have always been studied but too often in the sense of their being the last word in the developments in warfare. If the history of warfare teaches anything, it is that the means of making war have never remained static. But any approach to the last war for its lessons must be in the spirit, not of going back to it for its lessons but forward from them. History never repeats itself exactly; historical situations recur.

One of the residual theories from the days when a strong navy was all that was required for the free usage of sea communications has been that the Empire could be defended everywhere at the same time. This was no doubt true when wars were localized; but any future conflict in which the Common-

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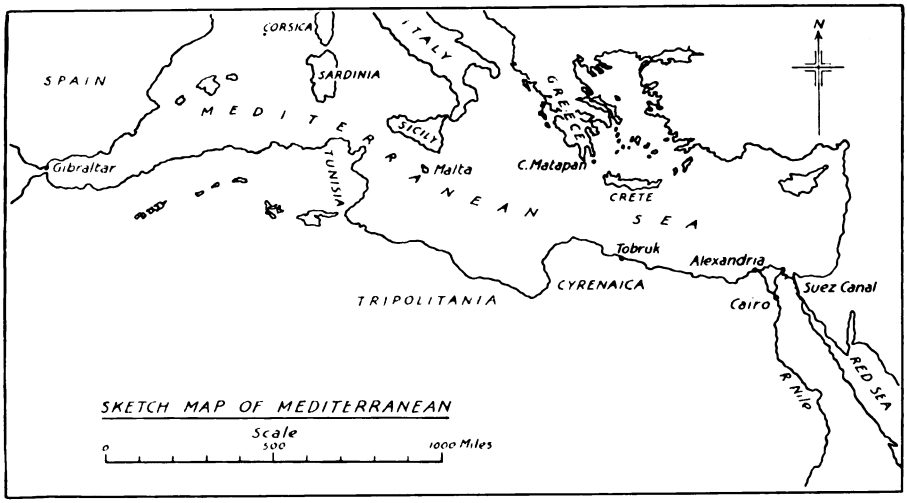
wealth is engaged seems likely to be world-wide. The history of the first three years of the late war need not be repeated; in attempting to be strong everywhere, the forces of the Commonwealth were everywhere weak. The impact of air power is that the very ubiquity of it imposes such strain on the forces available at the outset, that to attempt to defend the Commonwealth everywhere at the same time is fraught with disaster. The two qualities of flexibility and concentration of air power enable an enemy to strike at several places within an exceedingly short time, and thus force the dissipation of Commonwealth Forces. A decision must be made on the highest political level as to what are the essential or absolutely indispensable areas for various strategic reasons, and even those given an order of priority; instead of being forced by the march of events to make *ad hoc* decisions.

The problem of the security of sea communications is thus resolved into safeguarding the routes between the various areas in the order of their importance. What that order should be is not within the scope of this article; its purpose is the implications of the impact of air power on the main oceanic areas.



One general principle may be put forward, and that is the interaction and reaction of land, sea and air, in a closed sea such as the Mediterranean. The campaign in that sphere from June, 1940, to May, 1943, is the clearest example of the interplay of land, sea and air. "Excepting V and atomic weapons every aspect and form of modern war was exemplified."*

The war at sea in the Mediterranean in the first six months was dominated by the theory of the *fleet in being*. The "melancholy action" at Mers-el-Kebir was fought to destroy one fleet in being. The fleet at the eastern end of the Mediterranean was trailing its coat in a vain attempt to bring the Italian fleet to action. Its carrier aircraft in their night attack on Taranto showed what air power might do to a battle fleet in harbour. The passage of British naval forces from Gibraltar and Alexandria up and down the Mediterranean did not go unchallanged by the Italian Air Force, but its main force was heavily engaged in the land battle in Cyrenaica and was surely being forced out of the skies.

With the advent of the Luftwaffe into the Mediterranean, circumstances changed. Two months after the battle of Matapan, when by previous experience

* Marshal of the R.A.F. Lord Tedder. See Knowles Lecture, Cambridge, 3rd March, 1947.

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British naval supremacy was assumed in the area, naval forces suffered considerable losses off Crete. The capture of Crete by German airborne forces demonstrated unmistakably that sea forces could not operate with any degree of safety in an area where the enemy enjoyed air superiority. Nor were the Germans slow to follow up their advantage. Their development of air bases, and their deployment of air strength in Crete, Greece, Sicily and Cyrenaica gradually restricted the passage of Allied shipping until it ceased altogether. Malta could only be supplied at almost prohibitive loss.

The problem facing British and Axis alike was one of the free use of sea communications. The Axis had to be able to use their short sea route across the Mediterranean, from the mainland of Italy to Cyrenaica, so as to be able to keep their forces in the Western Desert supplied. The British problem was first to cut this route and prevent reinforcements reaching the Axis, and secondly to try to reopen the route through the Mediterranean from Gibraltar via Malta to the Suez Canal and the Red Sea route to the Far East and Australasia.

Malta was the key to the solution. So long as aircraft and submarine forces could operate effectively against the Axis supply lines, there could be no hope of them ever building up an overwhelming strength in Cyrenaica or in Egypt. When the operations from Malta rose to such an extent, the Axis on three separate occasions attempted to bomb it into submission. Malta held out and was able to continue its offensive and to deal a crushing blow to Rommel just before Alamein. Rumour has it that he saw two tankers being sunk by torpedo bombers at Tobruk and made a remark to the effect that "There goes Africa."

From the point of view of the effect of air power on the sea routes in the Mediterranean the land campaign was a fight for air bases, wherefrom the air superiority exercised over the battle area could be extended to enemy air-bases, ports and supply lines. As the land battle receded farther from the Egyptian border, so air power was able to make itself felt not only on the enemy unloading ports, but on harbours and railways in Sicily and Italy. With the successful landings in French North Africa, the Allies had now most of the south littoral of the Mediterranean. But as in the east, so in the west, the necessity for air bases.

With the merger of the eastern forces and western forces just before the final assault in Tunisia, air power came of age. There the operational formations were divided on functional lines of air power, i.e., tactical, strategic and coastal. Each of these three groups was able to assist one another as the need arose. The greatest achievement was the realization that air power could be more efficiently and more effectively exercised, and with an economy of force not otherwise possible by a centralized air command under the command of one Air Commander who directed the operations of all the air forces in the light of the air situation.

The success of air power exercised in Tunisia was clearly demonstrated in the last two months of the campaign. The undoubted air superiority which the Allied air forces wielded over the battlefield allowed the movements of large bodies of troops from one front to another with complete impunity. But the air superiority ranged far beyond the battle area; when the Axis attempted an evacuation he was shown that the air completely dominated the situation, and in co-operation with naval forces prevented more than a handful reaching Sicily. The lesson from this campaign is surely plain. Air forces are essential for the security of our communications through the Mediterranean. The former naval basis of our strategy in this area is no longer applicable.

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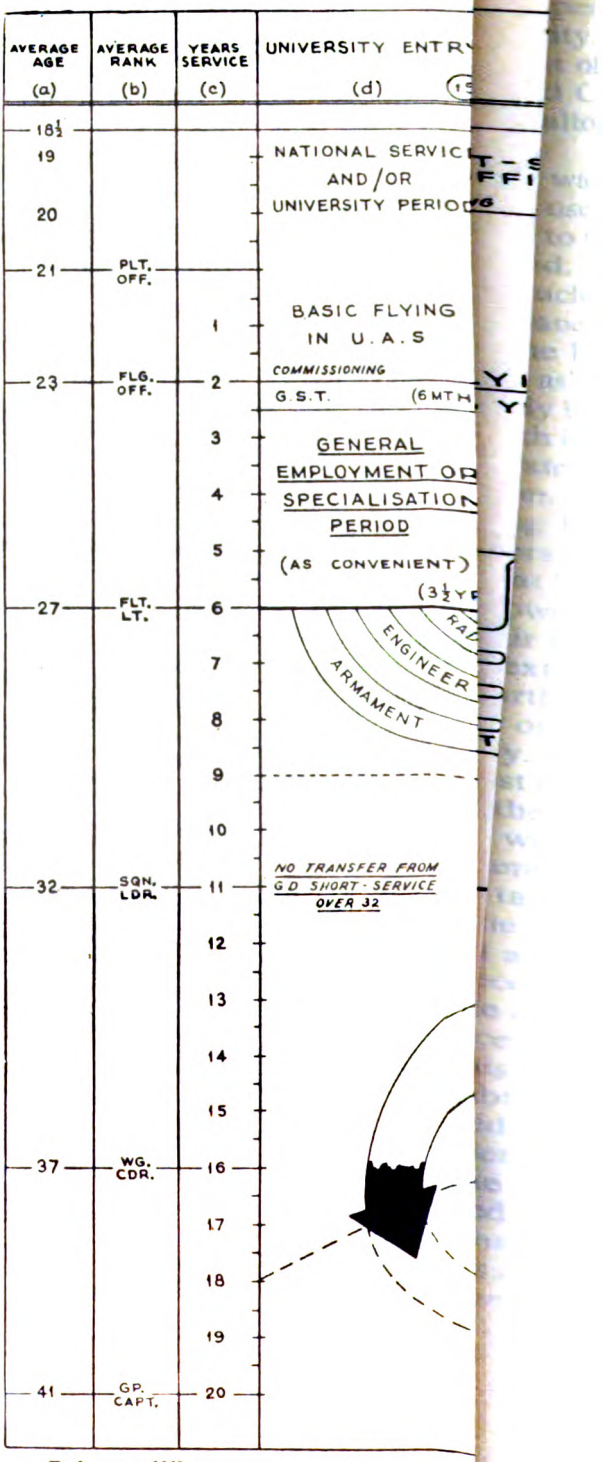

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A MATERIEL BRANCH FOR THE ROYAL AIR FORCE

MORAL: UNITY IS STRENGTH

By Korax

THE recent appointment of a Controller of Equipment and Engineering may appear at first glance as just a routine reshuffle in the hierarchy of the Air Ministry machine. On closer and longer examination of this appointment and all that it implies, some of us see the first firm step towards what many have long thought desirable, namely, an amalgamation of the Equipment and Technical branches to form a Materiel Branch for the Royal Air Force. Some of you will say at once that this is no new idea, that it has been with us for more than twenty years. It has; but what have we done about it? Have we faced up to it with realism and without sentiment? Have our trials with the Chief Maintenance Officer appointments overseas during the war, and with the A.M.T.S. and technical staffs concept since the war, brought any solution? They have not; and though many of us may see no need for change, the problem, as ever, stares us in the face. The proposal here is that every function of supply and technical application in our Service, bonded together in what we might, for generic convenience, term the Logistics Complex, should be the responsibility of one branch—the Materiel Branch, under the control of one member of Air Council —the Air Member for Materiel.

THE LOGISTICS COMPLEX

What is the Logistics Complex so far as it concerns equipment and excludes personnel? And what are the technical and equipment and supply functions which make it up? Have you ever wondered how a piece of equipment gets into the Service and what happens to it once it is there? Consider, for example, an Air Staff requirement, which may arise from a variety of reasons. The process of meeting it goes something like this:

If equipment to meet the need does not already exist someone has to design it, have a prototype or two made, have them tested and put on trial and finally have a production order raised. If equipment for the job is known to exist, the best to meet the requirement has to be identified and selected; and once agreement as to its use has been reached a producer must be found. He must be recognized as capable of producing the equipment and, nowadays, he must be supplied with the wherewithal to meet his production programme. Then, for equipment in either category, experts work out the quantity required and when delivery commences the item passes into store. There it may require special handling, special storage conditions, servicing whilst in store and general care and attention. The user then demands the item; it is put into use and it either goes on for ever—a rare and blessed occurrence—or the user breaks it or wears it out or runs it down. If it is beyond repair it is scrapped, but if it is merely in need of servicing and/or repair this is carried out. Then the item either goes back direct into use or finds its way into store again and the original cycle recommences from there.

Now everything after the original conception of the item to meet the requirement—the provisioning, production, delivery, storage, demanding, movement, servicing, surveying, repair and reissue—all this is really Supply. When we add the technical considerations on the use of equipment; the link between the Air

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Staff and its scientific and technical advisers; the administrative planning on Supply; and the considerable amount of research and development that is constantly taking place; then we have the Logistics Complex. And on the success or failure of this, as much as on any other single factor, depends the success or failure of any modern operation of war.

THE SUPPLY AND TECHNICAL SERVICES

To operate within this complex at the service of the Air Staff we have always maintained two separate sections, the supply and technical services. In the beginning the Army established, for its Royal Flying Corps, equipment officers who covered both aspects. The highest grade of these officers was that responsible for "technical provisioning," a counterpart to which is to be found in civil life where the technical procurement agent, or buyer, is among the highly paid officials of any firm. The formation of the Stores Branch in about 1920 and the introduction of specialization for general duties officers, the Trenchard Scheme, put the finishing touches to the separation of the two services. The Stores Branch, renamed the Equipment Branch in 1937, gradually filled up with supply officers who received a limited elementary technical training during their initial course. The G.D. specialists, well backed up by the old "138-er" and later by the product of the apprentice schools, found themselves becoming more and more involved technically at the expense of their flying, and finally most of them had to transfer from the G.D. list to the Technical Branch on its formation in 1940.

Down the years, these two services, though always separate entities, functioned until 1947 under the unified charge of the A.M.S.O./A.O.A./S.O.A. chain of control. Periodically the technical side made suggestions that responsibility for technical supply should be absorbed by them and that the balance of R.A.F. equipment—the quartermaster stores—should be the responsibility of the Stores Branch. The Stores Branch naturally resisted this, but was the contention fundamentally wrong? The only basic wrong about it was the suggestion to divide the supply system of the R.A.F. However, no such reorganization came about and we have witnessed a constant state of divergence, a slow internecine "cold" war in our whole equipment Logistics Complex. For the root of all supply problems lies in provisioning; and we have kept the responsibility for provisioning technical equipment in the hands of people not properly qualified to undertake it. But what is much worse, we have rightly allowed the technical man an advisory—sometimes a controlling—say in our provisioning, but we have wrongly never pinned on him the ultimate responsibility. Just examine for a moment where responsibility for equipment rests in the R.A.F. today. In the sphere of new equipment there are so many people responsible for operational requirements, technical requirements, test and trial, and research and development, that it is hard to pin anyone down and hold him responsible when things go wrong. In the realm of spares and re-supply items, however, it is always the Equipment Branch that is at fault, yet we have persistently delegated to it responsibility without proper backing. We have given our equipment officers whose responsibilities stretch from "buyers" and stock controllers of highly technical items to haberdashers, furniture dealers and fuel merchants, no basic training on equipment at all. Certainly we have taught them to handle the mountains of paper a democratic supply system demands, and a few have taught themselves to overcome the many difficulties of stultifying stores regulations at every opportunity. But we have given none of them any real technical training, not one bit of help to guide them either in requisitioning the millions

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of pounds' worth of equipment and spares which are required in the Service, or in looking after it properly when they have it.

The result of all this—this separation of the two supply agents, this giving of responsibility without proper backing—manifests itself in various ways, but chiefly in serviceability or otherwise of equipment, and in the number of demands for equipment of one kind and another outstanding in the depots. What is the remedy? Some technical officers will assure you that once they take over technical supply all will be well. The aircraft industry and the hundreds of suppliers of aviation equipment will gladly supply any item we require at the shortest conceivable notice; the difficult positions of demands in the storage depots will miraculously disappear overnight; serviceability on airfields will break all records. Do you believe this? Nothing could be farther from what actually would happen—until the Technical Branch had also learnt a few of the manifold logistics problems with which our supply system is grappling today, and until many other obstacles had been removed. For who is there in the Technical Branch who can be spared, first to learn the solving of these problems and then to take full responsibility, not only for correct provisioning, supply, servicing and repair of all equipment, but also for the maintenance of any force, wherever it may be? And here we come at once to a personnel problem which must be causing alarm to the hierarchy of the Technical Branch itself.

Consider the officer-manning position in that branch today. Transfer from the G.D. list, at least at the higher levels, has dried up; the "spill-over" scheme at the middle and lower levels has not yet got under way. The enormous expansion of the branch during the war could not, for obvious reasons, be met from civil life. Consequently, the vast majority of the officers required were found from the warrant and non-commissioned ranks of the Service itself; and these form the present hard core of senior flight lieutenants to wing commanders, inclusive, in the Technical Branch.

Soon after the war came the Hill Report, much of which was accepted; and a new organization appeared on our charts—the third prong of the Staff. This set-up is basically sound, though many will argue that any large undertaking runs most efficiently on only two prongs, the executive and the administrative. Ours is a highly technical Service, however, and the technical implications in financial expenditure, man-hours and logistics generally, justify representation at the highest level in the councils of peace and war. And the more direct the representation, the more the understanding and ultimate efficiency.

Now consider the Equipment Branch. Here the hard core consists mainly of the pre-war direct entry and short-service regular officers, leavened with a healthy proportion of business men who came in for the war and stayed, and a balanced proportion of officers commissioned from the ranks, who come, in the main, within the same category as their technical counterparts. It can be said that the proportion of young, able and efficient officers in the branch is considerably greater, *pro rata*, than in the Technical Branch. A glance at the record of those qualified in staff training alone will reveal the superiority in this one, but most important, consideration. In the ranks of squadron leader to group captain inclusive, the overall percentage so trained in the Technical Branch is 12 (Engineering 9.6: Armament 18.7: Signals 13.4), while in the Equipment Branch it is 24.8. Remember also that many equipment officers have distinguished themselves in the field of administration and organization, while the basic and overall task of the branch—the efficient supply and maintenance of the R.A.F.—also produced its fair share of men with brains, ability, drive and experience.

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Whatever the value of these two branches to the Service may be in separation, and none will deny that they played their parts well in testing times gone by, their value in integration will surely surpass all that has gone before. Remember, this amalgamation ushers in a period of change; that both these branches are still suffering from the war years; that parochial branch loyalties will give way to the greater absorbing loyalty to our Service; and that ultimately a single branch, recruited, trained and practised on the same doctrines and ideals, could take its place in our midst. Remember these things when you consider the proposal now placed before you for your critical approval.

THE PROPOSAL

So, for the good of our Service and come what may, we can ensure a sound and efficient equipment Logistics Complex in the R.A.F. by placing the responsibility for it on one branch under one channel of control. Whether the new Materiel Branch should form part of a Department of Materiel and Organization or be separated from the organization problems of the R.A.F. forms no part of this proposal. Such a decision, again, requires deep consideration and as so much of organization is linked inseparably with materiel, it may be thought proper to maintain the two in tandem. But organization is also linked with personnel and with general administration, which thought postulates at once an alternative arrangement. We can review here only the basic requirements of the new branch and leave the detailed planning to a subsequent study.

First of all, there would be three phases in this reorganization:

(*a*) A preliminary phase of about twelve months' duration in which the technical services and the equipment services were brought under unified control. This has already been activated by the appointment of a Controller of Equipment and Engineering, with the rank of Air Marshal, to co-ordinate the work of the Directorates-General of Equipment and Technical Services. During this phase integration of staffs should commence under the ægis of a small "Activating Committee."

(*b*) A follow-up phase of four years, starting with the establishment of the Materiel Branch, in which to weld together the two old branches. During this phase completion of the integration process would be achieved.

(*c*) A long-term phase, concurrent with the two short-term phases, during which a new genus of materiel officer would be trained and would gradually fill the branch. This would last some fifteen years or until the first fully trained materiel officer was promoted to wing commander in the new branch.

There are also certain premises upon which any plans for the new branch must be based. These are:

(*a*) A course does not make a specialist; it is merely the gateway to subsequent years of experience.

(*b*) There must be a clear differentiation between the high-grade technician and the routine servicing and repair officer.

(*c*) Specialization would be rare in the ranks of senior wing commander and above and would be confined to high-grade technical appointments, such as research and development.

(*d*) The Supply Organization is indivisible.

(*e*) The staff organization from the Air Ministry downwards would conform, in general, to the ranges of equipment in use in the R.A.F.

(*f*) The high-grade materiel officer would compose some 30 per cent. of the branch. The balance would be found from warrant officers of increased

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status, short-service officers and officers commissioned from warrant and other rank, with promotion ceiling for all these three grades at the rank of squadron leader.

(*g*) Whatever contracts may be in existence, the appreciable saving in officer man power occasioned by this reorganization should be effected by giving two years' notice to retire, on full pension, to all officers of the rank of group captain and below with World War I service to their credit.

(*h*) The Air Staff aspect of Signals and Armament functions should be covered mainly by G.D. officers who have specialized in these aspects of our technical requirements. The present tendency of the Signals Branch to veer towards the Air Staff is understood, but those responsible should not lose sight of the fact that there is a strong requirement for radio officers in the Materiel Branch. Two sections should not be allowed to build up, any balance in Air Staff needs being met by the higher grade Materiel Officers.

THE PROBLEMS OF INTEGRATION AND TRAINING

It would be idle to predict the smooth operation of a merger of this sort, but we should experience no insurmountable difficulties given a fair amount of good will on all sides. The future efficiency of equipment logistics in the R.A.F. is in the balance. A belief that the union of two large branches, one as old as the R.A.F. itself and the other the urgent and insistent child of a major war, is for the good of the Service should go far to give both sides that elusive common aim. The greatest problems arise in the first two short-term phases, when integration is the operative requirement and training important but secondary. The professional officer of some fifteen years' service or more who has proved by his past performances that he is capable of virtually anything can soon absorb the assimilation training required to make him universally postable. We cannot expect an equipment officer to absorb enough in a six or nine months' course to enable him to take on highly technical jobs in research and development. Very few technical officers would be similarly capable, whether their new duties were within their erstwhile specialization range or not. But we can soon build up a nucleus of officers with a sound professional background who, after a comparatively short course, would adequately fill 90 per cent. of the staff appointments responsible for supply, servicing and repair in the R.A.F.

Obvious outlets for integration are to be found in the staff organization of the Air Ministry, command and group headquarters and many large depots and operational units. Integration, under supervision, could commence at ranks as low as flight lieutenant. It already functions at air rank level in Headquarters, Maintenance Command, and Headquarters, No. 41 Group. More than a "mere handful" of equipment officers have some technical training or bent and well over a third in the wing commander and group captain range, and more than a fifth in the squadron leader range, have qualified in general staff training. Similarly, technical officers of the rank of wing commander and above would find little difficulty in rapidly assimilating sufficient supply background to render them capable of taking on any task, the bulk of which consisted of supply problems. In truth, the ex-G.D. technical officer would probably experience less difficulty in the integration period than his equipment opposite number. But there are so few of his kind, and we must be thankful that we have enough equipment officers, albeit they be technically "untrained," capable of taking on integration without much upset.

There is much less difficulty in the third or long-term phase, in which training

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is the operative requirement and integration a secondary but concurrent development. As our Materiel Branch will be one of our basic branches it must suffer in no way in comparison with the others. If we accept that the G.D. branch is the reason why all the others exist, we must provide it with the highest quality of support possible. Its logistics are vital and though history has proved this to us it has taken a major war to ram it down our throats. So, the majority of higher grade officers in the new branch must be trained at the R.A.F. College and start on common ground with the young G.D. officer. Because it would be foolish to miss the able and promising young man who does not reach the full flying medical standard, a lower standard should be accepted for the new branch. Flying, however, would be undertaken by as many as were medically fit to undergo training.

In the college entry, comprising about 50 per cent. of the higher grade category, a percentage would come from the R.A.F. apprentice schools, and some from young men on national service who decide early on a long-term career. The bulk of this entry, however, should come straight from the public schools. There would be a university entry, mainly intended to provide the nucleus for the special grade of officers required for highly specialized technical appointments. And finally, a large proportion, up to 35 per cent., would be found from the short service G.D. officer who could not be found further flying employment but who was worthy of a permanent commission. As all service to count for retired pay is now reckoned from the age of 21, that age is taken as the commissioning period for the cadet entry. University candidates, with engineering or other technical degrees, would enter at the age of 23 and with the rank of flying officer. The ex-G.D. entry would be selected after six years' service and would be required to pass something like the pre-war "specialization" examination. On transfer, these officers would enter at the bottom of the seniority list, in each year, of the rank which they hold. It would not be normal to transfer any G.D. officer to the Materiel Branch over the age of 32 or of the rank of squadron leader, though the door must always be left open for exceptions.

Specialization, which would commence some time during the last twelve months at the college and would be developed in an elementary manner during the first four and a half years' service, would be finalized during the last eighteen months of the first six years' service. It would be undertaken by ex-apprentices and university entrants only where their existing qualifications called for such training, but ex-G.D. entrants would undergo the same specialization training as the remainder.

Specialized employment would be interchangeable, under supervision, in large formations. Careful personnel selection in this would be of the highest importance. In the advanced training period, covering five years, all officers would be required to qualify at the Staff College, after which further technical training would be required. For those showing a particular bent for highly technical duties, and especially the university and ex-apprentice entrants, this training would be in very specialized technical subjects and would last any time up to two years. For the remainder, some form of assimilation training only would be required, with the officers of each section receiving a broad, but advanced, instruction in the work of the other three sections. This would last for some period between nine and fifteen months. Throughout this advanced training period it would be normal to carry on in specialized employment, but interchangeability, under supervision, would be encouraged. After this period and until promotion to wing commander, interchangeability, though still supervised, would be normal. On promotion to wing commander the officer would become

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universally postable, though, of course, he might well continue in specialized employment as required. Thus in the first sixteen years of service a maximum of four and a half would be spent on courses of training. Details of this training and work schedule are shown in the appendix.

STAFF ORGANIZATION

In the Materiel Branch staff organization, specific sections would be responsible for specific ranges of equipment; and each self-contained directorate would be solely responsible for every aspect of logistics for its particular range(s), with the exception of research and development and movements. Four divisions of responsibility immediately come to mind:

(*a*) *Directorate of Materiel* (*Logistics Plans and Co-ordination*).—This directorate would act as the staff branch for the Member of Air Council and would carry out all logistics planning and policy co-ordination.

(*b*) *Directorate-General of Materiel* (*A*).—This directorate-general would be responsible for all airborne equipment in the airframe, engine, and associated ranges.

(*c*) *Directorate-General of Materiel* (*B*).—Responsible for all equipment in the radio, instruments, electrical, armament, explosive and P.O.L. ranges.

(*d*) *Directorate-General of Materiel* (*G*).—Responsible for all ground equipment, mechanical transport, marine craft, tools, barrack and clothing ranges.

Each of these conveniently breaks down into sections which look something like this:

(*a*) *D. of Mat.* (*P.*).
- (i) Deputy directorate responsible for the Logistics Plans and Policy Co-ordination.
- (ii) Deputy directorate of Materiel Administration.

(*b*) *D.G. Mat.* (*A*).
- (i) Director of Materiel (Airframes).
- (ii) Director of Materiel (Engines).

(*c*) *D.G. Mat.* (*B*).
- (i) Director of Radio.
- (ii) Director of Electronics and Instruments.
- (iii) Director of Armament (including Explosives and P.O.L.).

(*d*) *D.G. Mat.* (*C*).
- (i) Director of Materiel (M.T. and Marine Craft).
- (ii) Director of Materiel (Ground Equipment).
- (iii) Director of Materiel (Barrack, Clothing and Miscellaneous).

Each directorate would break down into various self-contained deputy directorates and branches, much on the lines of the present Directorate-General of Equipment, and this staff organization would be reflected, with appropriate adjustments, in command and group staffs, the level at which integration could be accepted being decided by the commander.

CONCLUSION

This single, integrated branch and staff organization would provide the R.A.F. with a unified and sound agent to operate its equipment. Logistics Complex. Not only would it help to reduce the present administrative "tail," but it would also provide a more efficient instrument with which to sharpen the "teeth." Team work and a common aim engender a spirit of unity, and unity is strength.

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IS THE BRANCH SYSTEM PRODUCING THE LEADERS WE NEED IN THE ROYAL AIR FORCE?

By Wing Commander K. R. C. Slater, O.B.E., A.F.C.

"THE 'Be all' and the 'End all' of an officer is to be a leader." In these words, Field-Marshal Slim makes it clear that whilst specialist knowledge and experience is valuable it is of secondary importance in comparison with qualities of leadership. As an officer rises in rank, so his ability as a leader becomes progressively more important whilst the need for him to possess highly specialized knowledge tends to diminish. Hence in the Technical Branch of the Royal Air Force we see that on reaching senior rank, a signals officer is able to discharge the responsibilities of S.T.O. or S.T.S.O. with complete efficiency even though his specialist knowledge of armament and engineering is limited. The decision to broaden the range of appointments which can be filled by officers of the Technical Branch has proved to be a sound one and it is therefore appropriate to consider whether this policy might, with equal advantage, be extended to the rest of the Service.

In a modern air force a considerable number of high-ranking posts are required to direct the complex processes connected with administrative planning, technical organization and supply. The responsibilities associated with these posts call for outstanding qualities of leadership and a flair for organization and management, rather than the possession of highly specialized knowledge and experience. In these circumstances, it seems doubtful whether our present system of separating all officers into specialist branches constitutes the best method of selecting and training leaders of the calibre needed for the higher direction of the Service. With this in mind, the purpose of this article is to review the working of the Branch System and to suggest some of the advantages likely to be gained by appointing selected officers from all branches to a common "Air List" for purposes of posting and higher promotion.

A REVIEW OF THE BRANCH SYSTEM

The amount of training which can be absorbed by an officer, if he is to be employed productively, is obviously limited; thus on initial entry into the Service, a measure of specialization is unavoidable. For this reason, in the Army, officers are first trained on a regimental basis as infantrymen, gunners, sappers, signallers and so on, but those reaching the rank of colonel are then placed on the General List and become eligible for appointment to any of the higher posts within their service.

In the Royal Navy, on the other hand, officers commissioned in the specialist branches are not normally eligible for employment outside their branch at any stage of their career. This system appears to work well enough in the case of the Navy—possibly owing to the large proportion of officers in the Executive Branch who are required to specialize and who are therefore able to provide the breadth of vision and all-round experience demanded in the higher posts.

Prior to 1939 a similar arrangement obtained in the Royal Air Force when

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nearly all permanently commissioned officers of the General Duties Branch were required to specialize, on reaching the rank of flight lieutenant. Since 1939, however, far-reaching developments have taken place in the role and capabilities of aircraft, and junior G.D. officers are now obliged to devote the whole of their early career to mastering operational flying technique and in gaining administrative experience. Our specialist branches are thus deprived of the leavening of G.D. experience which formerly helped to weld them into a single team, and in consequence there is a growing tendency for branches to develop into watertight compartments. Indeed, the promotion of senior officers is now governed almost entirely by the establishment of the branch to which they belong, rather than by their qualities of leadership in relation to the Service as a whole.

The principal advantage of the Branch System is that by canalizing the training, thought and effort of individual officers, it enables them to acquire a higher degree of specialist knowledge and experience than would be possible if they were required to embark upon the whole field of Service endeavour. Thus it may be claimed that this system is the logical method of ensuring that officers of average ability are employed to the best advantage. Only officers of exceptional ability, however, can be regarded as eligible for higher promotion in any branch, and a system which restricts all officers to single avenues of employment, regardless of their ability, has obvious disadvantages which may be summarized as follows:

(*a*) Officers who are confined solely to employment within their branch can scarcely hope to gain the experience needed to develop that balanced appreciation of Service requirements which is essential if they are to fill senior appointments efficiently.

(*b*) Senior officers who lack breadth of vision may tend to place undue emphasis upon specialist ability, when reporting upon subordinates, so that the best leaders may not always be the ones selected for higher promotion.

(*c*) The career prospects of the more able individuals in each branch are strictly limited and officers who are keen to get on may be tempted to enhance their chances of promotion by resorting to "empire building"—a tendency which encourages jealousy and inter-branch suspicion.

THE ADVANTAGES OF PLACING SELECTED CANDIDATES FOR HIGHER PROMOTION ON A COMMON "AIR LIST"

Officers of all branches are selected for Staff College courses on merit, subject to their having passed the qualifying examination. Whilst successful completion of a Staff College course is not an essential qualification for promotion, it is a fact that few officers attain high rank without being "Staff Qualified" so that in practice the Staff Colleges can be regarded as filters through which most candidates for higher promotion pass at some stage in their career. This being so, it is suggested that selected Staff College graduates, irrespective of the branch to which they belong, should be placed on a common "Air List" for purposes of subsequent posting and higher promotion. Similarly, other officers whose merits and qualifications mark them out as likely candidates for senior rank could be appointed to the "Air List" at the discretion of the Air Council. In this way it would be possible to give suitable officers an opportunity to gain experience in administrative and other posts outside their own branch, with the object of fitting them to fill a wide range of senior appointments appro-

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priate to their individual talents and Service experience. An arrangement framed on these lines would have the following advantages:

(*a*) Better career prospects could be offered to the exceptionally gifted individuals in all branches so that higher promotion would be governed more by proven ability and qualities of leadership than by the requirements of a particular branch. This factor should help to attract the best type of officer into the Service.

(*b*) All senior officers would have a better opportunity of acquiring the breadth of vision and balanced appreciation of Service problems which are demanded by their responsibilities.

(*c*) The establishment of a common list for purposes of higher promotion would help to weld all branches into a single team and would eliminate the tendency to build watertight empires.

(*d*) There would be an all-round gain in flexibility and a larger proportion of officers would become universally postable which would help to remove promotion blocks caused by changing requirements.

CONCLUSION

In the Royal Air Force, "the best are only just good enough," and officers holding senior appointments should, rank for rank, be of comparable ability and experience, irrespective of the branch in which they happen to be serving. Few would claim that this is always the case in the Service today, which suggests a need to revise our methods of selecting and training officers for higher promotion. The establishment of an "Air List" on the lines indicated would be one way of ensuring that only the best leaders rise to the top.

H.M. THE KING TO PRESENT COLOUR TO R.A.F.

On 6th July, 1948, H.M. The King presented his Colour to the R.A.F. College, Cranwell. It was then intimated that His Majesty would later present a general Colour to the Royal Air Force as a whole. It has now been announced that this presentation will take place at a parade in Hyde Park on 26th May, 1951.

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MOBILE AIRFIELDS

By Squadron Leader A. Hughes, D.F.C.

Apologia pro Scripta Sua

In writing this article I have become increasingly aware of the gross *lacunae* in my technical knowledge resulting from an academic education. I have been encouraged to persist in my temerity by the reflection that many of the devices without which "Overlord" must have failed undoubtedly appeared fantastic when first suggested. Unlike "Cultivator No. 1," moreover, which absorbed a great deal of time and money in preparing for a need which never arose, the problem of airfield provision is already pressing and still unsolved.

THE PROBLEM

The problem to be solved is the rapid provision of all-weather airfields, from which high-performance fighter and ground-attack aircraft can operate, in the early stages of an amphibious assault and in mobile offensive warfare. In static warfare, or when our forces are retreating, the problem should not arise since sufficient permanent airfields should be available to us. As it is improbable that the Western Allies will be in a position to take the offensive for some time after the outbreak of a major war, manufacture of the necessary equipment need not be undertaken in peace time provided that plans for its production are ready. This problem has been aggravated since the last war by the advent of jet aircraft. We cannot afford to place any restrictions on the design of our aircraft which may result in lowered performance. In the initial stages of a war we shall inevitably be fighting against heavy odds, and only the superiority of our machines over those of the enemy can compensate for this disparity in strength. The primary requirement, therefore, of any new method of launching and recovering aircraft is that it should impose no limitations on performance, either by restricting landing and take-off runs or by the addition to the aircraft of specialized equipment.

Construction by conventional methods of the constantly growing runways and additional taxi track will place an increasing strain on engineer and transportation resources, already taxed by the demands of mechanizzed armies. A 2,500-yard runway of P.S.P., with limited dispersals, will require some 4,000 tons of steel and, if the airfield is to be used for any length of time, more than 10,000 tons of gravel to form an undersurface. Bit-Less, as used in Normandy, can be rapidly laid and needs only some 1,000 tons, but it has to be laid on dry ground and is easily damaged. Once water has soaked through to the ground beneath, it becomes virtually impossible to dry out and a soft spot develops. Permanent concrete runways, of course, need anything up to 15,000 tons of cement and 75,000 tons of gravel.

In an effort to reduce this growing burden, various suggestions have been made for limiting the ground run of aircraft. These include the use of arrester gear as in carriers; provision of catapults or R.A.T.O.G. for launching; and the employment of rocket-propelled launching trolleys, discarded when the aircraft is airborne, landing being effected on skids or on a rubber mat. All of these methods appear, however, to ignore the fundamental fact that air power depends not on numbers of aircraft but on sorties per given period. Anything which tends to lengthen the ground handling time of an aircraft, either by making it less mobile on the ground or by increasing the amount of equipment

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to be serviced between sorties, reduces the sortie rate and hence the effective striking power of an air force. Additionally, all these suggested methods involve bulky, expensive and vulnerable equipment which imposes structural limitations on the design of the aircraft they can operate.

A sound solution of this problem must offer the prospect of launching and recovery facilities which:

(*a*) Impose no restriction, other than all-up weight, on the design of the aircraft they can operate.
(*b*) Remain permanently serviceable in all weathers.
(*c*) Can be built rapidly and repaired easily.
(*d*) Require a minimum man-power effort in construction.
(*e*) Require a minimum of shipping space and of handling through ports or over beaches.
(*f*) Make the minimum demands on R.E. and R.A.S.C. resources.
(*g*) As far as possible are dust-free and proof against the jet efflux.

A SUGGESTED SOLUTION

Method of Construction

GENERAL PRINCIPLE. The basic idea is the construction of an airfield by the juxtaposition of flat-topped trailer units which form a raised platform some two feet above the ground. There is, of course, an inherent danger of much more serious damage than with normal airfields if an aircraft should run off this structure. It is probable, however, that this danger would be an acceptable operational hazard, since the tendency to swing on take-off or landing has been greatly reduced in jet aircraft by the absence of torque, while their excellent forward view and ground manœuvrability facilitate taxi-ing. Ramps would provide access to and from the structure for vehicular traffic, but aircraft would normally remain on it at all times.

UNIT CONSTRUCTION. Each unit must be of such a size as to be capable of towing on normal roads and of loading into landing-craft. Within these limits, the larger the unit the more rapidly an airfield could be assembled, and an overall size of 50 ft. by 10 ft. may prove possible. Calculations in this article have been based on an assumed size of 30 ft. by 10 ft., each unit consisting of:

(*a*) A flat steel top, ribber or roughened to assist braking, and fitted with a 1½-inch deep skirt to prevent one unit riding up over its neighbours.
(*b*) A cross-braced girder framework giving rigidity and bearing strength.
(*c*) Tracked undercarts at the rear of the trailer.
(*d*) Steerable tracked undercarts at the front, linked to a towing arm.
(*e*) Some system—such as brakes—of locking the unit firmly in place on the ground, without attaching it to its neighbours.

I am not competent to assess the weight of such a trailer, but it should be feasible to keep it to about 5 tons. This weight is, of course, the crux of the matter. Any substantial increase over 5 tons would render the scheme impracticable; any reduction in weight by concentration on larger units or by the use in whole or part of light alloy would enhance its possibilities.

AIRFIELD REQUIREMENTS. Accepting for the purposes of this article a unit measuring 30 ft. by 10 ft. and weighing 5 tons, a 2,500-yard runway 90 ft. wide (or about the effective width of the flight deck of a light fleet carrier) would take 2,250 units weighing 11,250 tons. Taxi-track, dispersals and so on as shown in Sketch "A" would increase these figures by 1,200 units and 6,000 tons, giving an overall requirement of 3,450 units and 17,250 tons. This is a very large figure

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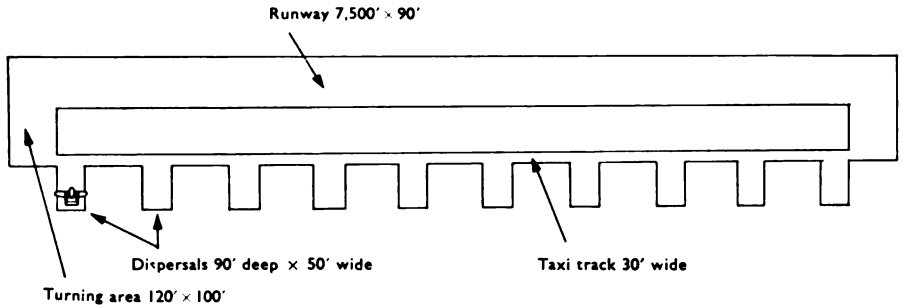
SKETCH A

LAYOUT OF AIRFIELD
(NOT TO SCALE)



NOTE.—Only 10 dispersals are shown. There could in fact be 26, with a gap 200 ft. wide between each one and the next.

UNITS REQUIRED

Runway: 3 x 750 = 2,250.	Turning areas: 2 x 4 x 10 = 80.
Taxi track: 1 x 730 = 730.	Dispersals: 26 x 3 x 5 = 390.

but must not be directly compared with tonnages of P.S.P., Bit-Less or cement, since:

(*a*) Each unit is mobile, and once hoisted into a landing-craft or on to a wharf requires no further handling.

(*b*) The units are not expendable. Once the initial tonnages have been landed the continuing requirement of replacement units, in conditions of air superiority essential for an amphibious assault or a mobile offensive, should be small.

SHIPPING SPACE. Demands on shipping space would inevitably be heavy but could be eased to some extent by the facility with which these units could be stacked one on top of another. Given suitable ramps, this stacking should also be feasible in landing-craft, at least three trailers being placed on each stack. The upper two could then be winched down the ramp by a tractor, coupled up and towed away. On this basis the average load for an L.C.T. would be about 12 units and for a L.S.T. just under 50.

BEARING LOADS. I am unable to estimate what ground pressures would be acceptable for these units. For the sake of illustration, however, I have assumed that eight tracked undercarts would be fitted, each having a contact area with the ground of 4 ft. by 1 ft. This gives a total contact area of 4,608 square inches, and a bearing pressure of 2.4 lb. per square inch for the trailer unladen, rising to 5.6 lb. per square inch when carrying a 15,000-lb. aircraft. It seems that these pressures should give satisfactory cross-country performance and a steady platform even on soft ground. If I am wrong, the pressures can be reduced by increasing the numbers or size of the undercarriage units.

Method of Operation

ORGANIZATION. I do not propose here to enter into a discussion of the possible organizations which could be adopted. I am assuming, for the purposes of this article, that in "X" Theatre the airfield system consists of:

(*a*) A Central Depot holding 5 per cent. reserve of trailer units, and including a Tractor Pool of 500 tractors and 1,000 drivers, as well as full repair and maintenance facilities.

(*b*) Ten Airfield Flights, each of some 25 men and each holding 3,500 units and 5 tractors.

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On this basis the overall manpower requirements for the construction and maintenance of ten airfields should amount to about 2,000 men.

THE AMPHIBIOUS ASSAULT. Let us consider an amphibious assault, the plan for which calls for the provision of one all-weather airfield to be in operation at a site two miles from the beach by first light on D+3. The planners decide to use 100 tractors, each with two drivers for continuous working, and each capable of towing two trailers. The time required for one complete turn-round is calculated as:

Unloading from landing-craft: 30 minutes.
Journey to and from airfield site: 30 minutes.
Positioning and locking of trailers: 30 minutes.

In each 1½-hour period, therefore, 200 trailers can be unloaded and placed in position. The planning time-table might then be:

1200 hrs. D+1. Airfield site captured. R.E. units commence levelling the site with bulldozers and graders.
1800 hrs. D+1. Landing of trailer units and construction of airfield begins.
1200 hrs. D+2. Runway complete.
2100 hrs. D+2. Airfield complete.

THE ADVANCE. Once the break-out has begun and our forces advance, airfields must be established forward. One existing airfield is taken out of use, and the whole resources of the Airfield Flight and the Tractor Pool made available to move it forward 50 miles. The turn-round time is calculated at:

Unlocking and hitching up trailers: ½ hour.
Fifty miles forward with trailers at 10 m.p.h.: 5 hours.
Positioning and locking trailers at new site: 1 hour.
Fifty miles back without trailers at 15 m.p.h.: 3½ hours.

In each 10-hour period, therefore, 1,000 trailer units are moved forward. Starting at 1800 hrs. on D-day, the complete airfield could be transferred by 1000 hrs. on D+2. In both the assault and the advance, judicious planning could provide a smaller airfield in much quicker time: a 1,500-yard runway with full dispersals could, for instance, be ready by 1200 hrs. on D+2 in the assault, or by 001 hrs. on D+2 in the advance, and aircraft could operate from it while the remaining structure was completed.

REPAIR. The repair of runway damage should present no problems. Since each unit is quite separate and is not linked in any way to its fellows, damage should be localized and the widespread distortion experienced with P.S.P should not occur. The units, being laid across and not down the runway, are easily withdrawn and replaced by serviceable ones. Repair of damaged units can be undertaken at leisure either on site or in the central depot workshops.

CONCLUSION

To sum up, therefore, such a method of construction appears to comply with all the requirements indicated above except economy in shipping. The advantages to be gained from a flexible and rapid means of providing all-weather airfields will in each case have to be balanced against the disadvantages of heavy demands on the specialized ships and landing-craft required to put it ashore. Once landed, it becomes an asset and makes no further calls on the overburdened Army services; indeed it may be of interest to the Army to point out that 528 of these units will provide a mile of 30-ft. all-weather roadway. The crux of the matter is the weight of an individual unit with the necessary torsional stiffness and bearing strength, and on this point I await with some interest the views of an expert.

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THE AIR FORCES IN PARLIAMENT

DEFENCE

THE high-lights in parliamentary proceedings in January and February this year, so far as the Air Forces are concerned, were the Prime Minister's Statement on Defence on 29th January and the subsequent debates in both Houses in February. Upon the question of national defence all parties are united so that the nation presents a united front to its potential enemies and to its friends.

Mr. Attlee's statement has been published as a White Paper (Cmd. 8146, H.M.S.O., 4d.). The Government's intentions therein announced, in so far as they affect the Air Forces, may be summarized as follows: They intend: (1) to call up for fifteen days' training about 10,000 R.A.F. officers and men of Class G Reserve who would be required to man the Control and Reporting Organization in an emergency; (ii) to call up for three months' continuous training about 2,300 members of the Royal Auxiliary Air Force fighter squadrons; (iii) to recall for a similar period more than 1,000 aircrew reservists of the regular and volunteer reserves of the R.A.F., with the possible call up for twelve to eighteen months of 200 additional aircrew reservists for flying instruction; (iv) to retain all regular personnel of the R.A.F. for twelve months beyond the term of their present engagements; and (v) to introduce as quickly as possible new types of aircraft. All this is, of course, in addition to the corresponding action for the Navy and the Army, to the necessary increased production of equipment for the Services and to stock-piling.

As the *Sunday Times* pointed out, the first of these measures does not increase the operational strength of the R.A.F. For this we must look to the long-period call up of Royal Auxiliary Air Force personnel, the recall of aircrew reservists and the retention of time-expired regular personnel for one year.

All members of the R.A.F. will have welcomed the Prime Minister's statement, not only because the nation is in obvious need of strengthening its armed forces but also because the air arm seems to be getting its fair share of attention. If the C.A.S. is right, the R.A.F. is to get the "lion's share" of the increased expenditure. This is an earnest of the Government's policy considerably to increase the striking power of the R.A.F. and to secure the latest fighter equipment in ample quantity. Attention is being paid to both offensive and defensive aircraft. It is understood that large contracts are now being placed for the Canberra two-jet bomber; and it is expected that prototypes of new four-jet bombers will be flown in approval tests and that the best of these will soon be put into production. For defence, new all-weather fighters and new fast interceptors are expected. Additional aircraft of all types are also to be ordered for new squadrons. But we cannot, at this stage, forecast the increase that will have taken place in the R.A.F. at the end of the three years covered by the statement; and, of course, the real test of the plans announced, as *The Times* said, is "how much and how soon they increase the country's actual fighting strength," i.e., so far as the air forces are concerned, "the number of extra squadrons put into the air."

Much comment has been made in the Press and on the radio of these measures, particularly of the call-up for fifteen days' training of Class G reservists. It is said that very little training can be done in fifteen days, even if all but the first and last are devoted to it; and that, Service life being what it is, at least half of this time and probably more will be wasted in documentation, in drawing and handing in

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kit, in queueing up for pay and in attending ceremonial parades. Frankly, we are not perturbed by these jeremiahs. In the first place, these reservists are not going to be taught new trades. They are going to be "refreshed" and brought up to date in trades that are identical with, or very similar to, the trades in which they were employed during their former service—a very necessary process, in view of the rapid development in all technical equipment and in procedure that is now taking place, and one for which fifteen days should be sufficient if time is not wasted on domestic and unnecessary activities. It is obviously up to the reception and disposal authorities and to commanding officers to see that all extraneous activities are reduced to a minimum and performed as quickly as possible; and we have every confidence that this will be done, to the greater efficiency of the man as a tradesman and to his greater satisfaction as a man.

Three months' training for members of the Royal Auxiliary Air Force will be very welcome and it will immeasurably enhance the fighting efficiency of that force. While there may be some truth in the comment that fifteen days a year in addition to certain evenings and week-ends, which is all that the Royal Auxiliary Air Force normally gets, is wholly inadequate, no one can deny that much can be done in three months, not only in instructing and practising the personnel in their operational roles but also in enabling the individual members of each squadron to "shake down" and form a well-knit team.

It is understood that Royal Auxiliary Air Force squadrons will be called up in two groups, between the middle of April and the middle of October. Most of the auxiliary squadrons will stay at their home bases for part of their call-up period. (We understand that some of the men whose homes are near will be permitted to live out and that 48-hour passes will be granted to the others at the discretion of commanding officers.) For the rest of the period, the squadrons will move to other stations and spend two weeks at the Armament Practice Camp at Acklington. Wing exercises and general interception will be prominent features of the training.

The 1,000 aircrew reservists who are to be recalled for three months' refresher training will need all this time, not because they may have forgotten what they learnt during their former service but because advances in aircraft design, in flying and navigational aids and in procedure have, during the past few years, been considerable. For the same reasons, a much longer period is necessary for the 200 reservists being recalled for flying instruction duties.

Throughout the whole of these plans, it is obvious that the greatest care is being taken to minimize, as far as possible, the inconvenience they will cause to the men and to their employers. And, having got the men, there is no doubt that squadrons and other units to which they will be attached will ensure that their periods of call-up or recall are made as profitable and pleasant as possible.

The two-day debate on Defence in the House of Commons on 14th and 15th February was disappointing in so far as it revealed little fresh detail of the Government's plans for rearmament. Perhaps the White Paper (Cmd. 8146) was comprehensive enough.

The debate did, however, reveal the true reasons for United Nations action in Korea and for our rearmament. Communist aggression in Korea is to be regarded as an experiment which, if successful, will undoubtedly be followed by further experiments elsewhere. The similarity between the political situation in Germany and that in Korea cannot be overlooked. Both are divided into Communist and Western spheres of influence, and what happened in Korea in 1950 might well happen in Germany at any time. Furthermore, attention has recently been focused on Yugoslavia, which is menaced by Russian satellite states on three sides. While our principal aim, now and at all times, is to preserve

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a just peace in the world, "our best chance of averting war is," as the Minister of Defence said, "to build up, as rapidly as possible, forces strong enough to deter a potential aggressor." We and our allies must make ourselves "too strong to be attacked"; thus we shall not only avoid war but we shall also be able to "negotiate from strength."

Mr. Shinwell informed the House that the re-equipment of the fighter squadrons of the R.A.F. with jet aircraft was almost complete, and excellent progress had been made with the re-equipment of those of the Royal Auxiliary Air Force. Moreover, aircraft were now in production which would enable bomber squadrons of the R.A.F. to begin to re-equip with jet bombers shortly. Deliveries of the new de Havilland Venom fighter were expected this year, and it was possible that we might acquire a number of American F.86's, which are the fastest fighters now in production. The Canberra bomber was already in production and squadrons equipped with them would soon be formed. Orders had also been placed for a four-engined jet bomber to replace the piston-engined Washington. Mr. Shinwell also assured the House that we led the world in jet engines, with the Avon and Sapphire.

For the close defence of the United Kingdom, Fighter Command was to be still further greatly expanded. The day fighter force had already been doubled and was going to be redoubled. The night fighter force was also to be greatly improved. Coastal Command was being expanded, the "run-down" of Transport Command had been stopped and air strength in the Middle East was being increased.

The Minister's summing up of the rearmament programme was noteworthy. He said: "In 1951 we shall get a useful accession to our strength; in 1952 things will begin to happen on a big scale; and in 1953 the new production should be running at its peak." Assuming that rearmament started in 1950, that accords with Mr. Churchill's famous declaration on turning over to war production. "During the first year," he said, "you get nothing, in the second year you get a trickle, in the third year you get enough for immediate requirements, and in the fourth year you get all you want."

The acid test of the rearmament programme, as Mr. Macmillan said, is in its implementation. The need is pressing. As we have seen, Western Germany and Yugoslavia are in danger. Persia, too, with its invaluable oil resources, is a constant temptation to the U.S.S.R.; and if Persia goes, the Middle East is threatened, including our oil resources in Iraq, Kuweit and Saudi Arabia. If an attack is made on Iraq or Persia, from whence can they be defended? Formerly we had large reserves in India that could be rapidly moved to those countries, but now we have none there. Clearly the Middle East must hold a considerable reserve of all three Services, and the most important in the initial stage of an aggression will, of course, be our air forces.

In the House of Lords debate on 21st and 22nd February, Lord Trenchard reminded their lordships that space on this planet had been conquered by aircraft. Our striking range was now 5,000 miles and that covered the northern hemisphere. He called for large numbers of long-range fighters and bombers by means of which, with the atom bomb and "block busters," we could keep all potential aggressors at bay. He pointed out that while the Canberra was "a wonderful machine" it was not a heavy bomber.

APPEALS FROM COURTS-MARTIAL

The Courts-Martial (Appeals) Bill was accorded its second reading in the House of Commons on 29th January. As its title indicates, the main object of the Bill is to provide a Court of Appeal for Service personnel convicted by

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Courts-Martial analogous to the Court of Criminal Appeal to which all citizens may have recourse on occasion.

The Bill was introduced partly because it was thought improper any longer to deprive sailors, soldiers and airmen, who are still citizens though serving in the armed forces, of the right of appeal even against conviction by courts-martial; but more especially because the code of law governing the trial and punishment of Army and Air Force personnel for offences under the Army Act and the Air Force Act was established in principle nearly seventy years ago. That code was originally framed for an old small professional army of long-service volunteers; and though it has been amended and modified from time to time, it manifestly does not suit, without further modification, a contemporary large army and air force consisting of long-service volunteers with a considerable National Service element as well.

Though hitherto the soldier and airman have had no right of appeal against conviction by a court-martial, they are already pretty well safeguarded. Before the verdict and sentence of a court-martial can be promulgated they must first be examined and confirmed by higher authority, e.g., the commander of the formation or force in which the accused person was serving at the time of the alleged offence; then the proceedings must be passed by the Judge Advocate General, who may quash them if he finds any serious faults in procedure; and after that the condemned man may petition the King, through the War Office or Air Ministry, for mercy.

The last of these safeguards the Service man shares with his civilian friend, but the first two are peculiar to the Army and Air Force. Now it is proposed, in the present Bill, to superimpose the right of appeal to a special Court of Appeal upon the three existing safeguards, without removing any of them. To that extent the Service man will be better safeguarded than he was before.

The Courts-Martial Appeals Court will be a civil appeal court and will consist, it is proposed, of the Lord Chief Justice and the puisne judges of the High Court, Scottish and Irish judges chosen by their authority, and other judges appointed by the Lord Chancellor. This Court will normally sit in London (though it might, on occasion, sit abroad) and appeals from all three Services may be heard by it. Its decisions will be final, except that the Attorney-General may certify, in extremely exceptional cases of public importance, that there can be a further right of appeal to the House of Lords.

The Bill further provides (in Part II) that the Judge Advocate General shall be appointed on the recommendation of the Lord Chancellor rather than on that of the appropriate Secretary of State, thus conforming beyond a doubt to the principle that judges shall not be under the control of the Executive; and it also gives statutory authority to what has long been customary practice, namely, that the function of the Judge Advocate General's department is purely judicial.

The advantages of this Bill, if it becomes law, are obvious since it will give to Service men and women a right of appeal similar to that enjoyed by civilians, and it will render miscarriage of justice almost impossible. And not the least of its advantages will be the fact that when this special Court of Appeal finds it necessary to dismiss an appeal, it will give its reasons and a sufficient explanation for so doing, which is not done when a petition is refused. Thus, in the phrase of a famous judge, not only will justice be done but it will also be seen to be done, which is just as important.

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LETTERS TO THE EDITOR

DEAR SIR,

I wonder if I might make a few comments on the review of the second volume of *The Army Air Forces in World War II*, which appeared in your issue of April last.

Among other complaints of the section written by me, viz., "The North African Campaigns," the reviewer considered that I went badly astray in stating that the British Chiefs of Staff suggested to Eisenhower that Tedder become his air commander. The reviewer stated that such a move had been suggested previously to Tedder by Eisenhower. I should like to point out that, in the context, I was using the term "air commander" in connection with an air command for the entire Mediterranean, on the order of the Mediterranean Air Command, and that Eisenhower's earlier suggestion to Tedder visualized the A.O.C.-in-C., M.E., acting as "co-ordinator" and adviser at Algiers. Eisenhower was preoccupied with capturing Tunis before winter set in and reluctant to stop to reorganize. By misconstruing this passage, the reviewer gives the impression that I present a tableau of Tedder being urged on a reluctant Eisenhower. I protest. Tedder needed no urging on anyone as an air commander.

I also stand accused of giving insufficient attention to the R.A.F.'s contributions to the African campaign. Because of space limitations, I could not describe R.A.F. operations in detail, but I tried always to present A.A.F. efforts in their true scale and dimension. I did not think it worth while to labour the obvious—that, taking the African campaigns as a whole, the R.A.F.'s contributions outweighed those of the A.A.F.—but I dwelt gladly on the special debt the whole A.A.F. owed to its association with the R.A.F. in the Western Desert and Tunisia. A thorough-going history of the R.A.F.'s exploits in the theatre had nevertheless, in the nature of the case, to be left for someone on your side.

Very truly yours,
THOMAS J. MAYOCK.

Our reviewer writes—

Mr. Mayock is himself guilty of misconstruction. The objection was to his sentence which included the phrase "evidently as part of a protest." There was no question of protesting against the appointment of Spaatz. The British solution—and the one adopted later with such outstanding success—was a complete reorganization of the air command throughout the Mediterranean. May I add that if his phrase "air commander" can be so variously interpreted, he ought to have defined it more closely?

His second point is one of comparison. In contrast with the other sections of the volume, it appeared and still does appear that he might have made more of the R.A.F. contribution, even if it meant "labouring the obvious."

T. M.

SIR,

Having read the article "Flying Classrooms for Royal Air Force Aircrew Training" in THE ROYAL AIR FORCE QUARTERLY dated January, 1951, I feel I must challenge one of the statements contained therein. The statement is as follows: "Inside the classroom will be up-to-date navigational aids which are *replacing the dead-reckoning methods* standard with Royal Air Force navigators for many years."

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The challenge arises out of your suggestion that dead-reckoning navigation as a technique is being largely replaced by other techniques and that the former is becoming obsolescent. This, as far as I am aware, is not the case. Certainly other techniques exist and are undergoing research and development, but in almost all cases these involve the use of intricate and delicate airborne equipments. Such equipments are prone to mechanical (or electrical) failure and until they have been developed to such a degree of technical perfection that failure is impossible, there seems to be little justification in abandoning dead-reckoning, or for suggesting that it should be abandoned. Dead-reckoning navigation, it is felt, must continue, if only to be used as a last resort when instrument navigational systems have broken down, and it appears essential that aircrews should still continue to be trained in the technique.

Dead-reckoning navigation consists of the calculating of the course, track, ground speed and position of an aircraft in flight, from a knowledge of the probable wind velocity and true air speed, by the solution of vector triangles. As a corollary, the knowledge of the aircraft's position enables the wind velocity which has been affecting the aircraft to be determined, and its possible future effect to be forecast. Whether this is done by the navigator in the air or the controller, who calculates his "vectors" on the ground, or whether it is done graphically as in "navigator" navigation or mentally as in "pilot" navigation, does not change the fundamentals of the system.

Navigational aids are, generally speaking, means whereby the navigator is enabled to fix the position of the aircraft. The position of the aircraft, so established, is then made use of in the dead-reckoning navigation system, in that the possible future position of the aircraft is deduced.

New aids to navigation are replacing the older aids which have been standard with Royal Air Force navigators for many years, and it is thought that the writer may have meant this, but has confused "aids to fixing" with the "dead-reckoning system of navigation." As, it is hoped, it has been made clear, the two things are widely different and at present there would appear to be no "aid" which is likely to replace dead-reckoning entirely. Future trends may lead to the solution of dead-reckoning vectors by mechanical or electronic means, and it is possible that the navigator may become a mere "set operator" whose job it will be to ensure that the set is working properly, and to be prepared to take over if the set breaks down. This, however, will still require that the navigator be trained in dead-reckoning techniques.

In conclusion, it is considered that the day when dead-reckoning navigation can be abandoned entirely is many years ahead, and until some entirely foolproof system has been developed to take its place, dead-reckoning must still continue to play an important part in aircrew training.

Yours faithfully,

G. FRANCIS BANYARD, *Flight Lieutenant*.

PS.—It should, of course, have been mentioned that the Pressure Pattern system of navigation is possibly the one exception where delicate and intricate airborne equipments are not required (if one excludes the radar altimeter, used in obtaining position lines), but the operational limitations of this system render it, so far as it is yet developed, an unlikely substitute for dead-reckoning.

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ROYAL CANADIAN AIR FORCE

R.C.A.F. ASSIST IN KOREAN AIRLIFT

ASSISTING in the stupendous and essential operational task of conveying personnel and material by air across the Pacific from America to Korea and vice versa is No. 426 (Thunderbird) Squadron of the Royal Canadian Air Force. This is the greatest "air-bridge" of all times, the United Nations airlift.

Although forming only a small part of this great airlift, no one on this job will forget the way the Canadian boys have handled their part of the show. The twelve big four-engined North Stars of No. 426 Squadron carry out this 12,000-mile round flight with an efficiency that maintains the highest traditions of the R.C.A.F. The flight from McChord Air Force Base, Tacoma, Washington, to Haneda Air Base, eleven miles from Tokyo, is routed along the southern route, by way of San Francisco and Hawaii, Johnston, Wake, Kwajalein or Iwo Jima, and the return journey to McChord by the northern route by way of Adak, 300 miles south-east of Shema, in the Aleutians (the northern Great Circle route), thus enabling aircraft to take advantage of the strong winds, which reach 75 miles per hour, blowing from east to west on the northern route, which makes a great difference to the speed of the aircraft and the amount of cargo or personnel carried. Relatively light winds are encountered on the southern route.

On the outward journey the weather is usually fine, and for hour after hour the big North Stars drone on under clear blue skies above a sparkling ocean. Through the night the navigator has a panorama of stars to use for his plotting operations. Radio reception can be exceptional, and the operator can often listen in to stations across the whole half hemisphere.

In comparison with the fog, rain and bad weather of the northern return route, flying conditions are good, but the aircrew cannot afford to relax, for both navigation and flying have to be "right on" to hit small targets such as Johnston Island, a chunk of coral set in the Pacific 1,500 miles from Wake Island, and hardly bigger than a large aircraft carrier.

Hawaii is the main stop-over base on the southern route, and crews get a chance to relax there, spending most of their off moments soaking up sunshine on the beach at Waikiki.

At Iwo Jima sometimes there is a three-hour stop for refuelling and a quick meal. This tiny volcanic dot in the Pacific, three and a half hours out of Tokyo, has historic associations and saw some of the most bitter fighting in the whole Pacific campaign.

On arrival at Haneda airport, Tokyo, the crews get a 48-hour rest, their aircraft being picked up and flown back by a fresh crew. This "slip crew" system, at both ends of the route, allows the North Stars to be kept in the air almost continuously while flying the circuit, apart from actual time out for minor repairs and inspections and refuelling. The system has nearly tripled the flying time monthly by the aircraft. Success depends on the perfect maintenance of aircraft.

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The responsibility which lies upon the shoulders of the captain of each North Star, in an undertaking such as this, is a heavy one. It speaks well for R.C.A.F. training to find, in addition to the war-time veterans of many bomb raids on Germany, young men in their early twenties carrying out this task with the same calm efficiency as the more seasoned and older men. Taking an example at random, there is Flying Officer M. D. Broadfoot, who just three years ago was being measured for his first Air Force uniform. At 22 years of age he has just passed from co-pilot to skipper of one of these large aircraft. Typical of the type of young man making up the younger aircrew, with three years' service he has more than 1,700 flying hours to his credit. The old slogan of "Join the Air Force and See the World" is borne out by such entries in his log-book as Paris, Tripoli, Cairo, Gibraltar, French West Africa, Greenland, Bermuda, Brazil and Tokyo. This proves that not only is the R.C.A.F. training first class but also that the right kind of material is being selected. Such youngsters are helping to maintain the very high traditions of the R.C.A.F.

Just a word for the navigators. According to the navigation leader of this squadron (Flight Lieutenant Ted Ratcliffe, D.F.C.) the Pacific Airlift operations are a cross between a navigator's dream and a nightmare. Nothing delights an air force navigator more than the chance to make full use of his complete box of tricks, and on this run they do just this.

At the same time seemingly unpredictable winds and bad weather often make these trips a "sweating-out" process for the slide rule and sextant boys.

The 25-hour flight is done about 95 per cent. of the time above cloud and with long over-water stretches. The navigators use combinations of such aids as Loran, astro-navigation, radio bearings and pressure pattern flying methods. The long trip from Tokyo to Adak, more than 2,100 statute miles, is the busiest time, as continuous position fixes are sent out, to let the ground stations know the aircraft's position. Astro-navigation ("shooting the stars") is the mainstay of the R.C.A.F. navigators, and follows the same basic principles used by master mariners of 100 years ago.

Although it cannot be used under certain conditions, astro has the great advantage of being one of the few navigational methods with which the enemy cannot interfere.

About 100 miles out from Adak the crews find they have suddenly run out of "today" smack into "tomorrow," as they cross the international date line, a fact that leads to general difficulties. Although not a serious problem to the navigators, it has played havoc with the birthdays of some of the crew, who missed them whilst on this flight.

To conclude. During the six-month period No. 426 Squadron have been flying the airlift, the "Thunderbirds" have flown nearly two million air miles. They have put in more than 8,450 hours in the air, and have carried more than 3,600 men and about 750,000 pounds of materials and mail between McChord airfield and Japan.

These 426 Squadron boys know the importance of the United Nations effort, and they know that they are helping to make R.C.A.F. history. All along the route the Canadian badges of the "Thunderbird" personnel and the maple leaf roundels of its aircraft command respect. It is a respect won by hard work and efficiency, and it is adding to the whole prestige of Canada abroad.

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ROYAL NEW ZEALAND AIR FORCE

"AIR-ARM" FOR FORESTRY SERVICE

By Flying Officer G. Bentley, R.N.Z.A.F.

FOR six months of every year since 1945 a very small detachment of the Royal New Zealand Air Force has had a very big "operational" assignment.

Officially designated "Aerial Fire Patrol," the detachment is an important link in a complex and scientifically planned organization, the alertness and mobility of which determines whether bush fires are to ravage each summer the great man-made forests of the Taupo—Kaingaroa—Rotorua area.

Established with two aircraft, two pilots, and a small servicing party, its "home" is the fringe of the Rotorua airfield and its field of operations the centre of the North Island of New Zealand, comprising almost 7,000 square miles of country or 750,000 acres of exotic and indigenous forest from which the nation will draw most of its timber. The biggest single block is the State forest of Kaingaroa (350,000 acres), the biggest man-made forest in the world. Nestling in this vast blanket of pines is the important village of Kaingarioa, headquarters of the State Forest Service.

PRECAUTIONS STEPPED UP

Until the introduction of the aerial patrol, disaster sometimes came to the forests in the form of devastating fires which swept uncontrolled through miles of tall trees, leaving brown, burnt-out areas in their wake. The big Taupo fire of 1946 was the last major outbreak in the North Island, and it destroyed 30,000 acres of valuable forest—a heavy toll. This disaster strengthened the hands of the State Forest Service, and enabled it to obtain new measures besides much-needed man-power and equipment. Among these measures was the Forest and Rural Fires Act, 1947, one of the effects of which was to have a fire authority constituted in every city, county, borough and town district of New Zealand to prevent the lighting of fires in forests and rural lands during the "danger season." The Forest Service was able to create its present huge-scale fire-fighting organization, designed more to prevent fires than to combat them; firebreaks were increased and widened; new forest look-out stations were erected; and the aerial patrol was placed on a better footing.

The first R.N.Z.A.F. fire patrol, in the summer of 1944-45, was provided by R.N.Z.A.F. Station, Ruhukia, in the Waikato district, an arrangement having been made with the Forest Service that an Airspeed Oxford and a pilot would be detailed for a flight if required. This was found far from satisfactory, and it was subsequently agreed that the "air-arm" of a forest fire-fighting organization could be efficient only if it was located at Rotorua (in the heart of the afforesta-

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[R.N.Z.A.F. Photo

THE TAUPO—KAINGAROA—ROTORUA AREA

Mile upon mile of pines, cut sharply into firebreaks, an important factor in fire control and for providing means of access. This is how the pilots like to see it—never a wisp of smoke

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tion areas), on a permanent basis during the dry season, and equipped with suitable light aircraft adapted for the purpose. Consequently, in 1945-46, the Aerial Fire Patrol was established at Rotorua, with D.H. Fox Moth and Tiger Moth aircraft. These, and Harvards, were used experimentally until the Auster J.5 aircraft replaced them two years. The Auster, which proved its worth as a spotting plane in World War II, was found the ideal aircraft, because of its low cruising speed, excellent all-round visibility, and ability to land on shorter runways.

The area which the R.N.Z.A.F. have to patrol is a big one, extending from the southern end of Lake Taupo to Whakatane in the north, bounded on the west by the Waikato River and on the east by the fringe of the Urewera country. The R.A.F. Flying College team which visited New Zealand last year flew over this area, and had an opportunity to appreciate the magnitude of the task confronting those responsible for fire protection of the forests. Flying 60 feet above the green belt it was possible to see the work of a quarter of a century spread out below—wide blocks of growing wealth—trees by the million, carved by firebreaks into a symmetrical pattern, and in one area east of the Lake, a ragged brown stain—dead trees, victims of fire.

With the passing of each summer, the trees of these forests advance another year towards maturity, and their increased value makes fire detection and control increasingly important.

INTEGRATED FIRE SERVICE

The Forest Department's fire service is closely integrated. At Rotorua the two pilots work to no rigid schedule, but are required to be on call at any time of the day. The Forest Service maintains on all prominent hilltops observers in look-out stations who, between them, can cover most of the forest area with binoculars. (There are eleven look-out posts in the Kaingaroa block alone.) All are in telephone communication with headquarters at Kaingaroa township, and most are equipped with radio. Twelve satellite patrol stations are strategically placed within the forests, each with its own R/T and fire-fighting equipment. Also in service are thirty fire engines, besides tankers and portable pumps—all ready for action at a moment's notice.

Suppose a major outbreak occurs. An itinerant camper, of careless habit, discards a smouldering cigarette into the tinder-dry bush skirting the mammoth forest. A small blaze develops, and quickly spreads. The outbreak is sighted by one of the observers from his elevated look-out station. An alarm is given by R/T to headquarters at Kaingaroa village and Rotorua. They in turn alert the Fire Patrol, and an Auster is airborne without delay, carrying a forestry officer as observer. Simultaneously, the ground crews swing into action.

Down on the ground, although the fire-fighters know the country to which they are directed, travelling through the firebreaks with a green wall on either side is travelling blind. This is where the air-

[Photo: R.N.Z.A.F.

Pekepeke look-out station—one of 11 such posts in the 35,000-acres Kaingaroa State Forest block

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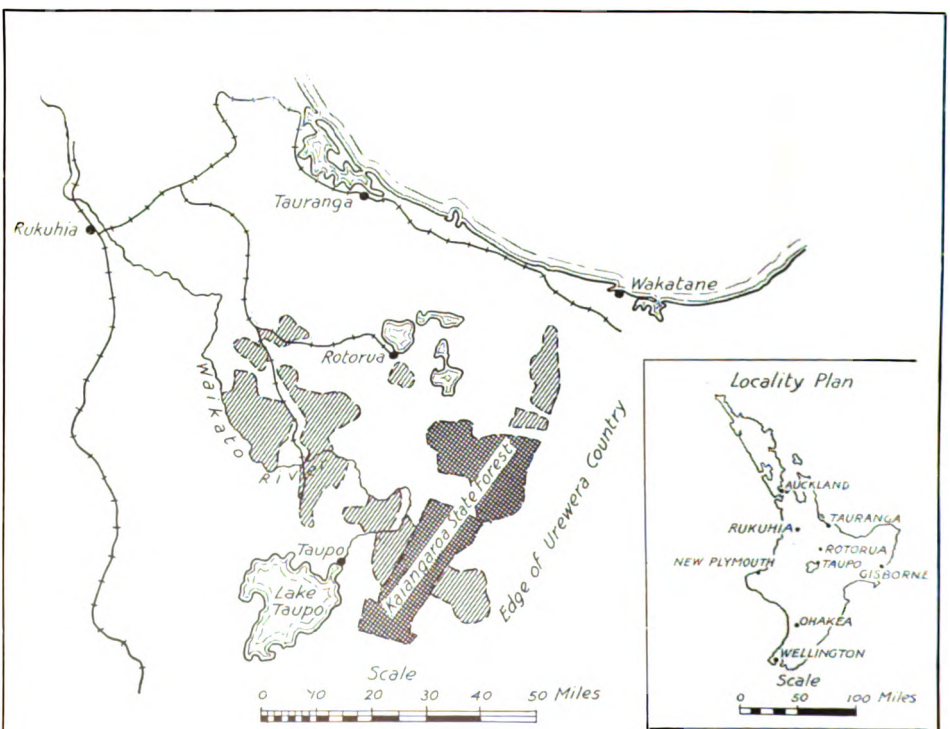
craft comes in. It pinpoints the fire and directs the ground party to the spot, guilding it over the quickest of many routes. Once at the fire, the observer in the aircraft takes over. He is in the position accurately to gauge the extent of the outbreak, and to assess the number of men necessary to combat it. If the ground party below appears aoo small, he can radio for reinforcements.

Reaching one such fire a few years ago the O.C. of a ground fire-fighting party decided that he needed at least another 50 men, besides more equipment. He sent for them. The aerial observer, however, could better appreciate the size and scope of the fire from his superior vantage point; and he cancelled the order. He was later proved right, and was commended for saving the Forest Service a big wastage of man-power, time and equipment. On another occasion two bulldozers were working from opposite sides of a forest block, putting through an emergency firebreak. They were required to meet in the middle. The R.N.Z.A.F. aircraft circled above, directed them by radio, and kept them on their course. They met exactly in the centre; and there was a straight firebreak clearly bisecting the plantation.

Radio intercommunication is a most valuable part of the fire-fighting system, as time saved might mean thousands of pounds worth of timber saved. Each Auster is equipped with radio tuned to the same frequency as those at the State Forestry Office in Rotorua, the other forest headquarters in the region, the hilltop observers, and the fire-fighters on the ground. (The fire-fighters carry portable sets.)



MAJOR FORESTS IN THE ROTORUA TAUPO AREA

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DANGER SEASON

Aerial patrol is used only during the dry season and in periods of low humidity. In New Zealand the "danger" season is from 1st October to 15th April, and the R.N.Z.A.F. detachment remains continuously in the area throughout that period.

Besides fire patrol, other uses have been found for aircraft in forestry work. Inspection of emergency airstrips and firebreaks, for instance, and the assessment by forestry officials of new growth or "regeneration"—for when trees are removed from the plantations by the demands of industry, and hauled away for milling, new young trees quickly take their place. Aircraft are also the most convenient means of locating high points for look-out tower sites, and of mapping the various afforestation districts.

The New Zealand State Forest Service is convinced that aircraft patrols are the most efficient method of fire protection and has been very appreciative of the R.N.Z.A.F.'s post-war "air-arm" contribution. The aircraft with two-way radio has proved its value and has given a modern flexibility to fire-fighting on the bigger scale. It is safe to predict that forestry organizations not yet served by aerial patrols will before long be looking around for the war-time "G.D. type," and seeking to add a necessary "air-arm" to their own ground fire-fighting system.

AIR COMMODORE C. E. KAY, C.B.E., D.F.C.

BIOGRAPHY

THE new Air Officer Commanding the R.N.Z.A.F. in London, Air Commodore C. E. Kay, C.B.E., D.F.C., is one of New Zealand's best-known aviators of the early era of flying. He is, perhaps, best remembered among contemporary airmen of the thirties for his England—Australia flight with Flying Officer H. L. Piper in 1930, and for his participation in the Centenary Air Race from London to Melbourne in 1934, with Squadron Leader J. D. Hewett, A.F.C.

A son of Mr. and Mrs. D. Kay, of Mangere, Auckland, New Zealand, Air Commodore Kay began his flying career when he entered the Royal Air Force on a short-service commission in 1926. He underwent a series of courses in England and Egypt, with the accent on navigation and meteorology, before he was posted to an army co-operation squadron in 1929 as navigation officer.

In February, 1930, then a flying officer, he obtained special leave to act as navigator and co-pilot to Flying Officer Piper on their flight in a Desoutter aircraft to Australia, which was an attempt at the England—Australia record. The following year he visited Germany to study at the gliding school at Wasserkuppe, where he gained honours.

After further service with the R.A.F. he took part in the Melbourne Centenary Air Race in 1934 as co-pilot to Squadron Leader J. D. Hewett, in a Rapide aircraft, in which they afterwards flew to New Zealand, becoming the first New Zealand crew to cross the Tasman.

In 1935 he joined the Royal New Zealand Air Force as a flying officer. He

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has been closely associated with the development of the air force in New Zealand from its infancy then to the present "jet-age" in aviation, having recently handled, as Air Member for Supply, the ordering of the R.N.Z.A.F.'s first jet fighter planes. Between 1935 and 1938 (when he was granted a permanent commission in the R.N.Z.A.F.) he held various posts at Wigram and Hobsonville, mostly as an instructor in navigation. He was awarded the O.B.E. in the King's Birthday Honours in 1939.

In that same year he was promoted to squadron leader and was sent to England for a course in astro-navigation at Manston, after which he was to join the first flight of Vickers Wellington bombers to New Zealand as second-in-command. The war broke out, the ferrying flight did not eventuate, and Squadron Leader Kay was detained in England, and attached to the R.A.F. He was quickly on active operations with the New Zealand Squadron, based at Marham (Norfolk), and gained the Distinguished Flying Cross in June, 1940.

[Photo: Spencer Digby, Wellington, N.Z.

Air Commodore C. E. Kay, C.B.E., D.F.C.

In November, 1940, Squadron Leader Kay was promoted to Wing Commander and became the second Commanding Officer of No. 75 (N.Z.) Squadron. He commanded 75 Squadron throughout 1941 and was then posted to No. 8 Group, R.A.F., which had just been formed for long-range heavy bombing. With the arrival in the United Kingdom of American heavy bombers, however, this group was taken over by the Americans instead, becoming the first U.S.A.F. group to operate from Britain.

A course at R.A.F. Staff College in 1942 was followed by his return to New Zealand in August of that year. Back with the R.N.Z.A.F., he became Commanding Officer of the air stations at New Plymouth, Ohakea and Wigram, in turn. He was promoted to group captain in 1943.

In 1946, Group Captain Kay returned to England, this time to attend a course at the Imperial Defence College. On his return in 1947 he was appointed to the New Zealand Air Board as Air Member for Supply. He relinquished the appointment temporarily that year to become Acting Chief of Air Staff during the absence of Air Vice-Marshal Sir Arthur Nevill in the United Kingdom. He was promoted to Air Commodore in the same year.

Further recognition of his services came in 1948, when he was awarded the C.B.E.

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SPORT IN NEW ZEALAND

By Squadron Leader J. M. S. Ross, R.N.Z.A.F.

ONE of my most vivid childhood recollections—it dates, I suppose, from the age of about twelve—is of the day I shot my first rabbit. I had stalked him, crawling in true Red Indian style through a patch of scrub, and got a clean shot at him with a .22. Not a very impressive kill, perhaps, but we must start somewhere.

There are, of course, bigger things to stalk. Before the coming of the white man, New Zealand had no game animals, and no sporting fresh-water fish; but during the past hundred years the defect has been abundantly rectified. Trout, salmon and many varieties of birds and deer have been introduced, and in most cases have thriven exceedingly.

[Photo: New Zealand Government

Hunter with Chamois, Mount Cook

Deer have multiplied to such an extent that they are now a serious nuisance. By eating the undergrowth they upset the balance of plant life in the bush, and in doing so menace the very existence of the bush in many places. By destroying the bush they open the way for soil erosion in the high country, and the silting of rivers and floods in the lowlands. The Government maintains bands of professional stalkers to keep the herds in check.

There is still plenty of room, though, for the amateur. The average New Zealander can have a day's stalking over bush and scrub-covered hills within twenty or thirty miles of his own house. Personally, I do not recommend it. There are apt to be too many other people doing the same thing, and some of them are too trigger-happy for safety. It is better to go into the back country with ten days' provisions, and camp in a shepherd's hut or under a tent fly.

The slopes of the Southern Alps and their foothills, running like a spine down the length of South Island, provide stalking country probably as good as anywhere in the world. River valleys, level-floored and grass-covered, the beds of ancient moraine lakes, run deep into the ranges. If you climb out of the valleys up 2,000 feet of bush-clad mountainside, you come out into tussock, alpine scrub and snow-grass. Here, among the ridges and gullies running to the snow line, you find your deer.

Red, fallow and Virginian deer, wapiti and sambur can all be found in various regions; or, if you want strenuous exercise up on the snow line, there are thar and chamois to be had.

In the fiord country of Western Southland, Canadian moose have been established. They have not increased in numbers as quickly as the other types of deer,

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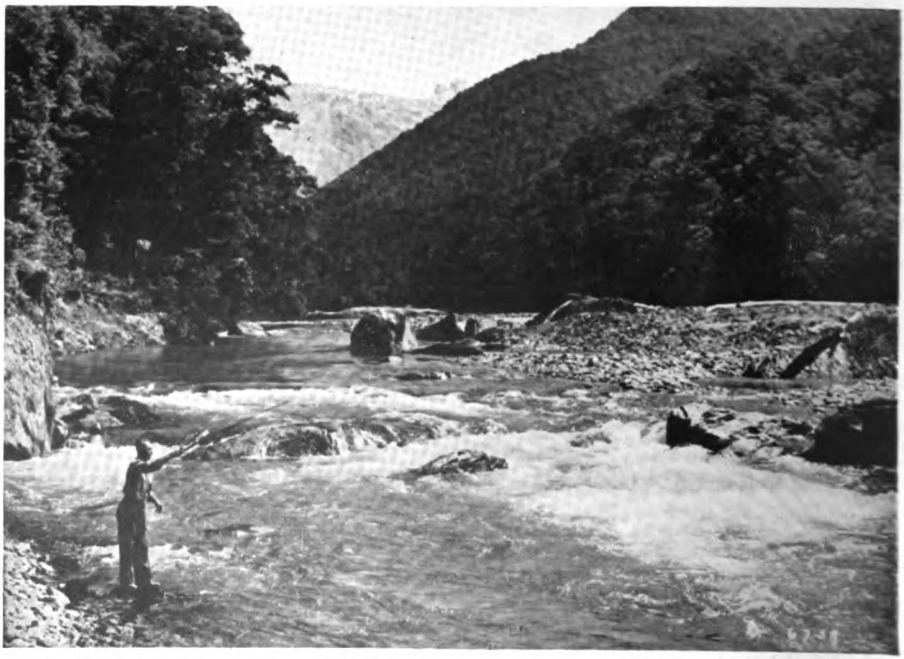
[Photo: New Zealand Government

Deer Country, Western Southland



[Photo: New Zealand Government

Fishing in the Wilkins Valley, Makarora, Otago

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and their haunts are very nearly inaccessible. Consequently they are rarely seen.

The opening of the duck-shooting season, early in May, is an event of almost national importance. In the dark hours of early morning, enthusiastic gentlemen creep into hides in the rushes surrounding every lagoon in the country, and crouch there awaiting the dawn. It has always appeared to be an overrated pastime. To have good sport you must have bad weather; but hundreds of people disagree with me.

Numerous varieties of duck can be shot, both native and imported, as well as black swan, Canadian goose and the pukeko or native swamp hen. Their distribution is widespread—wherever there is water—but the open season is short.

The shooting of native land birds is forbidden. Most of them are weak fliers, and their natural enemies brought by the white man—weasels, rats, cats, dogs and fire—kill many of them.

Pheasant and chicken have been introduced and are plentiful in some parts of the North Island, while Californian quail are common in many places.

One of the joys of shooting in New Zealand is that there are vast areas of uninhabited or sparsely settled country where you can roam at will, without asking anybody's permission, and in the more settled districts the obtaining of permission is usually a mere formality.

The same applies to fishing. Provided you have tackle and a licence, you can fish practically anywhere.

Rotorua, more generally known for its geysers and boiling mud pools, is in the centre of some first-class trout fishing country. The many lakes and streams in the district produce excellent brown and rainbow trout. In the lakes, fish of up to ten pounds are fairly common, and on one, Lake Tarawera, there is a reasonable chance of landing an occasional eighteen-pounder. In the rivers, a five-pounder is a good average fish.

Lake fishing is done with large wet flies, like, but less highly coloured than, European salmon flies. The rivers give ample scope for both dry and wet fly, and a good variety of fishing conditions. Your choice can range from secluded, rarely fished pools deep in the bush to clear open water running over wide shingle beds in the open country.

Lake Taupo, in the middle of the North Island, and the dozen rivers running into it, provide perhaps the best rainbow trout fishing to be found anywhere. Twenty-pound fish are caught in the lake and occasionally in the Tongariro river, and ten-pounders are relatively common.

The lake fishing, particularly at the mouths of rivers and at a number of other feeding grounds, is good in the early part of the season—from December to February—while the rivers are better from mid-February till the end of the season in May. It is then that the fish run up the river to spawn, and they are in first-class condition and generally heavier than in the earlier months.

Most of the chief rivers of the South Island rise in the glaciers of the Southern Alps, and flow eastward through the foothills and across the plains of Otago and Canterbury. In their upper reaches they are mountain torrents and hardly fishable; but after they descend to the valleys and emerge in their wide shingle courses on to the plains, they contain splendid brown trout and quinnat.

Many smaller streams are equally good and are more consistent because, not being glacier-fed they are not subject to flooding and discoloration by snow-water. The southern lakes, Wanaka, Hawea, Wakatipu and their river system, all contain good trout and quinnat.

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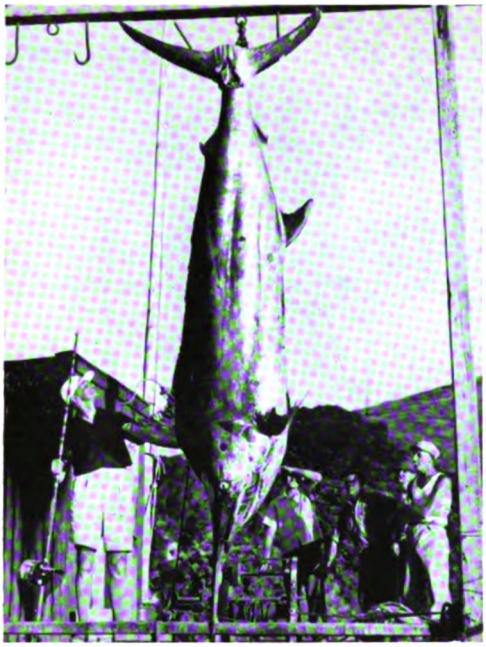

[Photo: New Zealand Government

Black Marlin, 883 lb., caught at Bay of Islands, 1949

Atlantic salmon, so far, are established in only one river, the Waiau, which drains Lakes Te Auau and Manapouri, and runs into the sea at the extreme south of New Zealand. They are taken mainly in the upper part of the river and near the outlets of the two lakes. Artificial minnow is the best bait, although the large wet fly is fairly satisfactory.

Unlike the quinnat, which is increasing in coastal waters, the Atlantic salmon does not appear to run to the sea as it does in its native habitat.

People who want something bigger than trout and salmon go to the Bay of Islands, in the far north of the North Island, or the Bay of Plenty, on the north-east coast, for deep-sea fishing. There, trolling a three-pound kahowai as bait behind a slow-moving launch, you do battle with the big-game fish and at the same time become desperately sunburned.

An average swordfish, weighing 250 pounds, takes about three-quarters of an hour to play, and is an exhausting antagonist.

Black and striped marlin, broadbill swordfish, mako, thresher and hammerhead shark and kingfish, are all officially classed as game fish, and are magnificent fighters, while a number of lesser fish also provide reasonable sport.

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SPORT IN THE R.A.F.

R.A.F. EQUITATION ASSOCIATION

THE Royal Air Force Equitation Association, which exists to encourage horsemanship in the Service, has now joined forces with the R.A.F. Modern Pentathlon Association.

Members of the R.A.F. are showing increasing interest in modern pentathlon events (riding, pistol shooting, cross-country running, fencing and swimming), and R.A.F. teams will now be organized by a sub-committee of the Equitation Association. The merger of the two organizations will result in the provision of more comprehensive training facilities for R.A.F. pentathlon competitors.

At the Equitation Association's recent annual meeting it was announced that the President's Cup (presented by Air Marshal Sir Aubrey B. Ellwood), awarded annually to the member who has shown outstanding keenness and progress in horsemanship, had been won by Leading Aircraftwoman D. Chandler, W.R.A.F., who is engaged on administrative work at the R.A.F. Hospital, Ely, Cambs. The date of the formal presentation has not yet been decided.

Formed two years ago under the chairmanship of Air Vice-Marshal S. C. Strafford, the R.A.F. Equitation Association now has more than 200 members. Annual subscriptions are one guinea for officers and five shillings for airmen and airwomen, with riding fees of four shillings an hour for officers and three shillings an hour for airmen and airwomen. Frequent ten-day courses of instruction are held, for which officers pay three guineas, and airmen and airwomen two guineas. Broadly speaking, the object of the Association is to encourage riding as a recreation in the R.A.F., thus providing an additional off-duty attraction to Service life.

The Association has recently moved its H.Q. branch from Knaphill, High Wycombe, to R.A.F. Station, Halton, Bucks, where it occupies the former Rothschild stables. The provision of a covered school, so that instruction may be independent of weather conditions, is under active consideration. Branches also are functioning at R.A.F. stations Mildenhall, Suffolk, and Boscombe Down, Wilts, and it is intended to open other branches to serve areas where there is sustained interest among R.A.F. personnel.

B.A.F.O. YACHTSMEN ENTER FOR 1951 FASTNET RACE

Yachtsmen from the British Air Forces of Occupation, Germany, are entering for the Fastnet Race, the longest and most important British ocean race, which usually takes place in August. The B.A.F.O. crew will be drawn from R.A.F. yachtsmen in Germany who are members of the various British sailing clubs. They will use one of the boats allotted to B.A.F.O. and based at present at Kiel.

EXTENSIVE PROGRAMME FOR R.A.F. SAILING ASSOCIATION

The 1951 plans of the R.A.F. Sailing Association include the formation of an ocean cruising section, the appointment of Rear Commodores for the cruising and dinghies sections, and the formation of a committee to supervise conversion of the Association's airborne lifeboats. Plans are already in hand for a regatta and for participation in the R.A.F. Inter-Command Ocean Race. The Association also hopes to have a new burgee which will incorporate the R.A.F. roundel.

There are now forty clubs and nearly a thousand members in the R.A.F. Sailing Association, whose fleet has been augmented by seventy-six airborne lifeboats purchased from the Air Ministry with the aid of a grant from the

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Final of the Inter-Command Rugby Competition. Flying Training Command trying to get the ball from a line-out

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R.A.F. Sports Board. In addition, the Association possesses ten national dinghies, ten "Yachting World" dinghies, and a number of ex-German dinghies, making a total fleet of 108 craft.

Group Captain N. C. Walker, of R.A.F. Station, St. Athan, has been appointed Rear Commodore of the dinghies section, and Wing Commander F. C. Griffiths, of R.A.F. Station, Abingdon, Rear Commodore of the new cruising section, which may form with two cruising boats loaned by British Air Forces of Occupation, Germany, and which will have the use of the cruising *Pirrol* lent by H.Q., Coastal Command. Warrant Officer G. S. Lang, of R.A.F. Station, Pembroke Dock, and Flight Lieutenant R. H. Williams, of R.A.F. Station, St. Eval, will head the committee to supervise the conversion of airborne lifeboats.

The Commodore of the Association is Air Commodore A. W. B. McDonald, and the Vice-Commodore is Squadron Leader W. H. Cauley, of H.Q. Maintenance Command. This year there will be two secretaries, Wing Commander E. P. M. Fernbank, of H.Q., 90 Group, for cruising, and Flight Lieutenant S. R. Hawkey, of the Air Ministry, for dinghies.

DEVELOPMENTS IN R.A.F. SPORT IN CANAL ZONE OF EGYPT

Sport, which plays a large part in Royal Air Force life in the Canal Zone of Egypt, with association football most popular, has made considerable strides during the past six months.

Throughout the winter season, rugby, soccer, hockey, badminton, tennis and other sports were well supported, and most of the annual inter-service matches between the British Army and the R.A.F. were held in February and March.

New developments, directed at absorbing the ever-growing numbers of devotees to each particular sport, have taken place in rugby, water-polo, badminton, table tennis, hockey and darts.

In rugby football the biggest development has been the institution this season of "Internationals," in which Army and R.A.F. teams have played a "round-robin" tournament involving English, Welsh and Scottish-Irish teams. These matches have proved popular attractions and are likely to become annual events.

In water-polo last season, interest in the game was so great that the regular Sunday afternoon matches of the R.A.F. Egypt Water-polo League could not absorb all those wishing to play. To meet the demand a "Wednesday" League was formed, which enabled many second-class swimmers to take part.

Table tennis is attracting more and more players, and the R.A.F. Canal Zone Table Tennis Association has been divided into two leagues: Canal Zone North and South. At the end of the season, the leading teams in each league will compete for the championship of the R.A.F. in Egypt.

Badminton has been put on an organized footing in Egypt for the first time, with the formation of the R.A.F. Egypt Badminton League, split into northern and southern sections.

350-MILE R.A.F. CYCLING MARATHON

The Royal Air Force Cycling Association is to stage its first cycling marathon, a 350-mile five-day cycling race, from 2nd to 6th July, inclusive. All R.A.F. stations throughout the United Kingdom may nominate four entries, three of which will count for team points.

The race will start from R.A.F. Station Henlow (Beds) and the first day's "leg" will take riders to R.A.F. Station Cottesmore (Rutland), a distance of 65 miles. The second day's racing will consist of two events, the first from

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Cottesmore to R.A.F. Station Cranwell (Lincs), a distance of 40 miles, and the second from Cranwell to Newton (Notts), bringing the day's total mileage to 65. The third day's ride will be one of the hardest, for 75 miles will be covered from Newton to Cosford (Staffs). The following day the competitors will cycle 70 miles from Cosford to Innsworth (Gloucs) and on the final day there will again be two events; in the morning from Innsworth to Kidlington (Oxon) and in the afternoon on to Halton (Bucks), to bring the total up to 350 miles.

All the events will be raced as time trials, but if permission is granted by the National Cyclists' Union, the organizing body will consider arranging two massed start events on the first and second days.

Awards will be presented to all the successful riders. There will be a cup for the rider completing the course in the fastest time, and silver medals for the runners-up. Competitors who finish within thirty minutes of the winner for the whole of the course will receive bronze medals, as will the first and second fastest riders in each day's events. There will be a trophy and silver medals for the winning team.

The Association hopes that about 120 riders, representing thirty R.A.F. stations, will compete.

AIR TRAINING CORPS BOXING CHAMPIONSHIPS, 1951

Young boxing enthusiasts of the Air Training Corps, who achieved their ambition of boxing at the Royal Albert Hall in this year's championships, did so before a distinguished gathering of past and present members of the Royal Air Force.

The opening bout, between T. Christie, of 1703 (Kilsyth) Squadron, and M. Inwood, of 1223 (Caerphilly) Squadron, was a spirited affair and a good curtain raiser to the evening's sport. Christie won this closely contested opening match by a narrow margin of points, and Inwood put up such a spirited fight against his successful opponent that he was awarded the Roy Limbert Cup, for the best loser of the evening.

Several of the bouts that followed ended rather more abruptly. A. Monahan, of 281 (Southport) Squadron, won his fight in the first round, J. Webster, of 39 "F" (Barnes) Squadron, knocked his opponent out in round one, and J. Smith, of the same squadron nearly achieved the same success but had to wait until the opening of the second round to "floor" his man. In the last fight of the evening G. W. Fox, of 103 (Doncaster) Squadron, gained a "knock-out" within the first minute of round one. It is difficult to say on the form shown what these five dark horses will do in May against their opponents from the National Association of Boys' Clubs, but we wish them luck.

By training a vast number of enthusiastic competitors, so that entries could be made at all weights and no points lost by absence from the ring and several gained by winning four bouts and securing losers' points for the remainder, No. 61 (Eastern) Group secured the Harewood Trophy for the highest number of points in the finals. This seems to be a sound policy in encouraging a larger number of boys to box, rather than specializing in a few possible champions. When the evening ended and H.R.H. The Duke of Gloucester presented the Harewood Trophy a good evening's sport had been enjoyed by all.

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SINGING FOR HIS SCHOOL FEES

BY "PATERFAMILIAS"

THERE can be but few parents who can face without horror the thought of a son's school fees. Even the wealthiest must quail at the prospect of two sons, each at a cost of £200 a year, which at present levels of taxation means earning about £700 a year to pay for school fees alone. We have three sons.

Some people can so organize their affairs that they live near good day schools, but not those who live a nomadic life—the gipsies, tipsters, tinkers and Service families. For us a boarding school education for our children is a necessity. They cannot be left to pass through a succession of varying day schools, being uprooted every second year. Since we have no county which is our home, the grammar school is in effect denied to our children, and the highest to which they can aspire in the State system is the modern secondary school. If our children are to get a good start in life it must be at a boarding school. Unfortunately, as in the case of many other things, the most expensive boarding school is the best value. To the class which is least able to pay then, and which is already taxed to pay for the education of other people's children, the most expensive form of educational establishment is a necessity.

At the public school stage the bright boy can win scholarships and so help his needy parents; for the younger boy there is no means of competitive examination whereby he can help work his way through the preparatory stage. There are, however, some thirty choir schools in the country where boys can obtain a good preparatory school education at reduced or nominal fees, if they can sing.

These schools vary from those at which there are no fees, such as St. Paul's Choir School or Durham Cathedral School, through various intermediate stages to schools such as St. George's, Windsor, or the Pilgrim's School, Winchester, where the much reduced fees for a chorister still amount to about £30 a term. These choir schools vary in size from small ones for choristers only to large boarding or boarding-cum-day schools in which the choristers are in a minority. Their educational standard also varies, but the leading ones are among the best preparatory schools in the country and have a formidable scholarship record to the public schools.

At these schools the chorister will have the normal education. Experience shows that his intellectual development, so far from being impeded, is, in fact, helped by his other duties. These are heavy and may amount to one or two practices and the singing of one or two services a day. He will often be taught to play some musical instrument free of charge. As he grows older his holidays will be shorter than normal, and he will, of course, be at school for the great Church festivals of Christmas and Easter. From my own memory I can assert that this is no great hardship, since, in fact, it meant two Christmas Days—one at school and one at home on the following day. At many schools nowadays two choirs are maintained so that the load on the individual boy is reduced.

There are many advantages, besides mere economy, to this form of education. The chorister has the benefit of a good musical training and the æsthetic advantage of helping to create great music in buildings of incomparable beauty, such as King's College Chapel at Cambridge. He gains poise as he works his

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way up from probationer to soloist, singing to as many as two thousand people and perhaps being broadcast. He may be lucky and attend during his life as a chorister some great national ceremony; he might be at Westminster for a royal marriage, at St. Paul's for a national service of thanksgiving, at Windsor for a Garter service. But, above all, must be ranked the spiritual benefits.

The financial advantage of a choir school education does not end at 14, for some of the schools give valuable bursaries on to the public schools, and some even give assistance to the universities. The ex-chorister also is well placed to compete for the many open musical scholarships offered by the public schools and at the universities.

How and when can a boy qualify for these valuable benefits?

The trials for the various schools are held usually in the spring and summer for entry in the following autumn. The trials are advertised in the personal column of *The Times* and in other journals. Provided that contact has been established with the appropriate authority, be he Dean, Warden, Precentor or Headmaster, parents will be informed of forthcoming trials. Boys are usually eligible between the ages of $8\frac{1}{2}$ and $9\frac{1}{2}$. They must be baptised members of the Church of England, and produce evidence of good health and behaviour.

The trial has two sides: musical and intellectual. On the musical side the candidate's voice will be tested by the singing of scales for tone, range and volume. His ear will then be tested for accuracy by being required to sing the middle or bottom note of a chord struck on the piano, or by the following of a swift succession of notes struck at random. He will then be required to sing a prepared piece, chosen by the candidate, usually consisting of a hymn or simple aria. Some knowledge of musical theory is an advantage, as also is the ability to read music and play an instrument. The intellectual side consists of a simple written examination or intelligence test to make sure that the boy is not noticeably backward in other respects. The candidate is always required to read aloud to test for fluency and enunciation.

Competition, of course, is high. For a good choir as many as seventy boys may attend a trial at which only four vacancies may be granted, but this does not mean that only the musical genius of saintly behaviour will succeed. Organists have learnt that a choir cannot be built on genius alone, for this may be temperamental and unreliable. At a trial they will normally choose a high-spirited boy who can stand the strain of a fairly full life, who is bright and keen and shows promise of being able, under skilled training, to develop an accurate, pure and powerful voice. The *sine qua non* is the accurate ear, for one boy out of tune can disturb a whole choir.

How, then, can the normal boy who shows no exceptional sign of musical ability be led to success?

The greatest help is a musical background in the family, not the passive music of the wireless or gramophone, but the active music, however poor its quality, of voice and instrument. The surroundings of other boys in church or school choir can show him the pleasure to be obtained from singing and so help him to enjoy the work. Care must be exercised in the choice of his fellow singers, however, for a rough tone can soon be picked up and yet take a long time to eradicate. At the age of 6 thrice-weekly lessons should begin; a series of short lessons will be found better than a few long ones. They should include scales with particular attention to accuracy of pitch and purity of tone, arpeggios with no slurring, simple tunes and ear tests. Later, a grounding in the piano will help with his musical theory. His ambition should be stirred by listening to such

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good choirs as are available locally and to those choirs of national reputation which frequently broadcast on Tuesday afternoons. Two or three years of steady work will bring him to the great day.

A cold on the day of the trial would ruin your boy's chances; he must be brought to the starting gate in prime condition. To ensure this it will be necessary to enter him for more than one trial. At the last moment in the stable you may want to clear his throat by a gargle, a sip of olive oil or a suck of a lemon. Thereafter it is up to the boy. All you can do is to sit and sneer at the other parents waiting as anxiously as you. We have done it once and have got to do it twice more.

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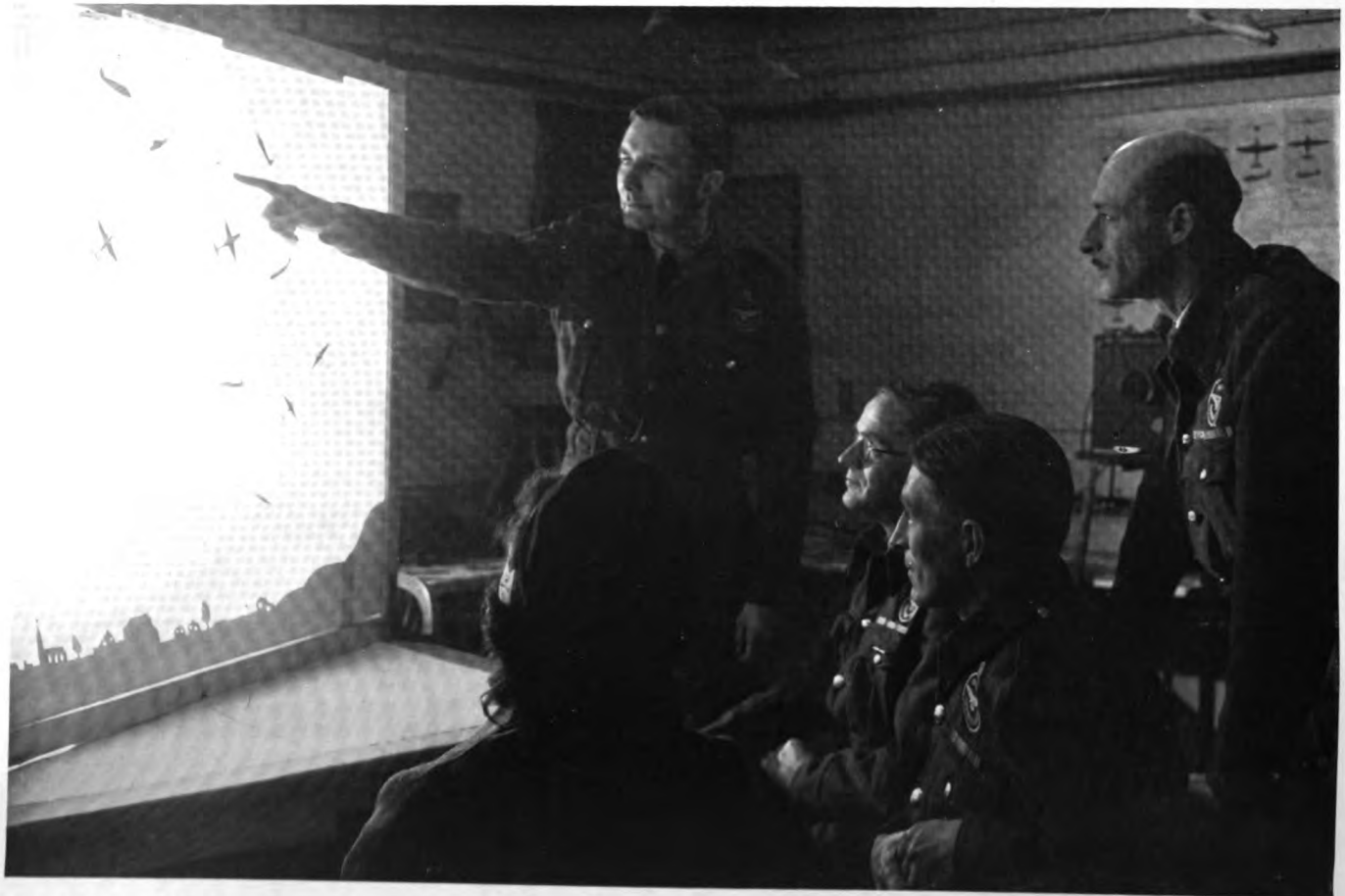

[Air Ministry photo

In the "Gen Room" at Group Headquarters. Observers are being trained in aircraft identification

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CURRENT EVENTS

Royal Observer Corps

THE Royal Observer Corps' role is that of locating and tracking aircraft by visual means, and it forms an integral and vital part of R.A.F. Fighter Command's raid reporting and fighter control system.

The illustration is of observers in the "Gen Room" at a Group Headquarters being trained in aircraft identification. Earlier this year the 1951 All-England Annual Aircraft Recognition Competition of the Aircraft Recognition Society was held at the Science Museum, South Kensington, London. Competitors (in teams of three), representing clubs, societies, Service units and the Royal Observer Corps, were expected to identify thirty-five "Flying Views" of aircraft shown on a screen. The holders of the trophy, a silver model Hurricane, were the North-West London Branch of Air-Britain.

One hundred members of the Royal Observer Corps have received the first awards to be made of the R.O.C. Medal for twelve years' or more service. This medal was instituted by Royal Warrant on 31st January, 1950. It is of cupro-nickel with the crowned effigy of the Sovereign on the face and, on the reverse, a representation of an Elizabethan coast watcher holding aloft a torch and standing by a signal fire in the days of the Spanish Armada. The colours of the ribbon are light blue with a silver grey central stripe, on either side of which are narrow dark blue stripes.

Although the Corps is now over 15,000 strong, some 13,000 more observers are required.

Age limits are from 16 to 55 (58 or, exceptionally, 63, for ex-war-time observers). Volunteers serve a minimum of three years, undertake some three hours' training a month, and attend exercises from time to time. Uniform is free and annual grants of from £1 5s. to £2 10s., in addition to certain travelling allowances, are made. There are additional grants of 10s. and £1 for passing the "Intermediate" and "Master" tests.

Fighter Control Units' Summer Camps

More than four thousand officers, airmen and airwomen of Fighter Control Units of the Royal Auxiliary Air Force are expected to attend summer camps at R.A.F. stations for a fortnight this year between May and September.

These volunteers are training to man Britain's control and raid reporting system. In war-time, the Fighter Control Units would be nerve centres of Fighter Command, and their duties would include keeping constant radar watch, plotting the movement of all aircraft, calculating the course, height and speed of suspected "hostiles," and directing our own fighters into a position where enemy aircraft could be seen, identified and destroyed. During the war these plotters and controllers played a vital part in the destruction of thousands of enemy raiders. Locations and dates of the camps are:

At a station in Devonshire: No. 319 (County of Suffolk), 5th to 19th May; No. 3500 (County of Kent), 19th May to 2nd June; No. 3505 (East Riding), 2nd to 16th June; No. 3620 (County of Norfolk), 16th to 30th June; No. 3504 (County of Nottingham), 30th June to 14th July; No. 3511 (City of Dundee), 14th to 28th July; No. 3603 (City of Edinburgh), 4th to 18th August; No. 3604 (County of Middlesex), 18th August to 1st September.

Coltishall or Horsham St. Faith, near Norwich: No. 3512 (County of Devon—Exeter), 2nd to 16th June; No. 3611 (West Lancashire), 16th to 30th June; No.

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[Air Ministry photo

Korea. Wounded being unloaded from an aircraft

[Air Ministry photo

Malayan airmen of the R.A.F. Regiment (Malaya) in a jungle warfare exercise

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3508 (County of Northumberland), 30th June to 14th July; No. 3614 (County of Glamorgan), 14th to 28th July; No. 3608 (North Riding), 28th July to 11th August; No. 3507 (County of Somerset), 11th to 25th August.

Wittering, near Peterborough: No. 3618 (County of Sussex), 5th to 19th May; No. 3617 (County of Hampshire), 26th May to 9th June; No. 3510 (County of Inverness), 16th to 30th June; No. 3612 (County of Aberdeen), 30th June to 14th July; No. 3602 (City of Glasgow), 14th to 28th July; No. 3609 (West Riding), 4th to 18th August.

Martlesham Heath, Suffolk: No. 3613 (City of Manchester), 2nd to 16th June; No. 3605 (County of Warwick), 16th to 30th June; No. 3502 (Ulster), 30th June to 14th July; No. 3513 (County of Devon—Plymouth), 14th to 28th July; No. 3509 (County of Stafford), 28th July to 11th August; No. 3506 (County of Northampton), 18th August to 1st September.

New Transport Command Service to Japan

A new shuttle service between Singapore and Iwakuni, Japan, via Manila, has been started by R.A.F. Transport Command. Four-engined Handley Page Hastings aircraft are used, carrying freight and passengers into Japan, and returning as ambulances with battle casualties from Korea.

The new service operates once a week, supplementing the existing twice-weekly Dakota service of the Far East Air Force.

At Singapore the casualties, with any other patients requiring treatment in Great Britain, are transferred to ambulance aircraft on the Transport Command Far Eastern trunk route.

In addition to British casualties, the ambulance service has brought back wounded from the French, Netherlands, Greek and Turkish contingents of the United Nations force in Korea.

Casualty Evacuation by Helicopters in Malaya

Since the formation of the Far East Casualty Evacuation Flight in Malaya over six months ago, twenty-one casualties have been evacuated by helicopters from the remote depths of the jungle and transported to hospital. Not only is the helicopter service saving much valuable time, but it also means a much more comfortable journey for the patient than was the case when he had to be carried by stretcher along narrow twisting paths.

Patients who need to be carried lying down are carried in specially designed wicker baskets, which they only exchange for the comfort of a hospital bed. In one case, a little over an hour after a soldier had received injuries from a grenade he was in a hospital operating theatre twenty miles away from the scene of the accident.

The sick or wounded men have included British, Gurkha and Malay members of the Security Forces operating in the jungle.

The twenty-first casualty—a Malay soldier of the Malay Regiment—was uplifted from a small clearing in dense jungle in North Perak and taken to hospital in weather described by the pilot as the worst he had experienced in Malaya, which forced him to keep an escorting Auster of the A.O.P. Flight in sight all the time in order to get any horizon.

The success of the helicopters in landing and taking off in small clearings on hill sides, in small valleys and by river banks, and often surrounded by trees 200 feet high, has exceeded all expectations and has enabled patients to receive much earlier medical attention than would otherwise have been possible. The Malays have coined a special name for the helicopter and call it "billalang," meaning grasshopper.

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The C.-in-C., Far East Air Force, Air Marshal Sir Francis Fogarty, and the Acting Base Commander, Seletar, Group Captain J. T. Mynors, talking to some of the pilots who ferried the first flight of six Vampires from the United Kingdom to Singapore

[*Air Ministry photos*

The first National Service officers of the R.A.F. selected for training in aircrew duties in Canada lend a hand with the Hastings aircraft in which they are about to leave London Airport to cross the Atlantic

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Rearming Far East Squadrons with Jet Fighters

Vampire jet fighters are now being flown from the United Kingdom to rearm fighter squadrons of the Far East Air Force. The 8,850-mile journey to Singapore represents the longest jet-fighter delivery flight undertaken by any air force. Airfields in France, Tunisia, Libya, Egypt, Jordan, Iraq, the Persian Gulf, Pakistan, India, Burma and Siam are used. The route was surveyed and organized with the co-operation of the governments concerned for ferrying these jet fighters. Flights will continue to be made at regular intervals until the delivery of all aircraft is completed.

In the illustration will be seen the C.-in-C., Far East Air Force, Air Marshal Sir Francis Fogarty, and the Acting Base Commander, Seletar, Group Captain J. T. Mynors, talking to some of the pilots who a few moments before had landed at Seletar at the end of their 8,500-mile flight which was completed in 27.45 hours' flying time. On the left of the picture are: Squadron Leader P. J. S. Shaughnessy, the Flight's Commanding Officer (rear), and Flight Sergeant D. Smith. On the right, next to the Group Captain, is Flight Sergeant Williams.

Biblical References in Exchange of Signals in Malaya

Biblical references were used in a recent exchange of signals between Malayan Scouts on active operations against bandits in the jungle and a R.A.F. Dakota Squadron which had dropped supplies to them.

The Malayan Scouts signalled: "Troops very impressed by way in which drop was carried out and wish to convey their admiration and gratitude to crew and dropping crew. See Psalm 78, verses 27 and 28. Again, thank you." Verses 27 and 28 of Psalm 78 read: "He rained flesh also upon them as dust, and feathered fowls like as the sand of the seas. And he let it fall in the midst of their camp, round about their habitations."

To this signal the R.A.F. Dakota Squadron, which is based at Kuala Lumpur, replied: "Your signal greatly appreciated. See Psalm 9, verse 18." The verse referred to is: "For the needy shall not always be forgotten: the expectation of the poor shall not perish for ever."

Canada Helping R.A.F. Training

Addressing the first 28 R.A.F. National Service Pilots to go to Canada for training under a new scheme by the Royal Canadian Air Force, the Secretary of State for Air, Mr. Arthur Henderson, said:

"You are the forerunners of an increasing number of aircrew who will be training in Canada under the Aircrew Training Scheme which has been set up with the co-operation of the Canadian Government, and which was announced last year.

Last week the Canadian Minister of Defence stated that it was the intention of his Government to offer increased training facilities to North Atlantic Treaty nations. The British Government welcomes this offer. We intend to avail ourselves of these facilities and we hope to train in Canada, as soon as arrangements can be made, a substantial proportion of the increased number of pilots and navigators who will be required under the Government's rearamament programme.

In going to Canada you will be going among friends, and I am sure that you will be welcomed with all the kindliness and hospitality which are characteristic of our Canadian cousins."

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Assyrian native officer of the R.A.F. Levies (Iraq)

Royal Air Force Levies

A typical Assyrian native officer of the R.A.F. Levies (Iraq) is seen in the inset picture. He is the Rab Emma (Squadron Commander) and his name is Baijo Rihana. The oldest member of the Levies, having joined the Force thirty years ago, he was Regimental Sergeant-Major at the age of 18 and has held his present rank since 1922. Originally Turkish, he later became Assyrian, and is the senior native officer in Headquarters Squadron at Levy Headquarters, Habbaniya.

Walking-out Dress for R.A.F. Regiment (Malaya) includes a Sarong

A picturesque feature of the walking-out dress approved for the Royal Air Force Regiment (Malaya) is a sarong of light blue interwoven cloth, with a vertical panel, worn to the rear, in the Royal Air Force colours of maroon, light blue and dark blue.

The sarong, 36 inches deep, is worn from the waist to a little below the knees over white poplin long trousers made in the Malay style. The walking-out dress is completed by a white poplin shirt in Malay style and a blue-black velvet Malay cap, known as a songkok, on the front of which is worn the R.A.F. airman's badge. Ultimately it is intended that the shirt and trousers shall be made of silk, but the present cost of the material makes this impracticable for the time being.

Middle East Demonstrations by R.A.F. Regiment

Exercises in the Middle East are demonstrating what the R.A.F. can teach Britain's young National Service men in the Royal Air Force Regiment in the short space of two months' overseas' service.

At a recent exercise at the Geneifa firing range in the Canal Zone of Egypt, gunners of a R.A.F. Regiment rifle squadron in half an hour of three-inch mortar firing raked a target 2,000 yards distant, and showed how they can lay a smoke screen to cover advancing troops by dropping mortar bombs.

After the exercise, men of the same rifle squadron took part in a miniature airlift operation from R.A.F. Station, Kabrit. Five Valetta transport aircraft were loaded with Regiment jeeps, motor-cycles and men to fly in formation to Port Said and back, to give the squadron experience of how units are transported by air to the battle front in war time.

Expediting Rearming of Belgian Air Force

To speed up deliveries of Meteor 8's to the Belgian Air Force, Gloster Aircraft have completed negotiations with Fairey's to set up an immediate production line at the Avion Fairey Works in Gosselies, near Charleroi, Belgium.

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New Automatic Ejection Seat for High-Speed Pilots

Ejection seats which throw the pilot clear of his aircraft have been in production for aircraft of the Royal Air Force and the Royal Navy for some time, but a new automatic type of seat is now under development. It has been found that in high-speed, high-altitude fighters, the pilot might lose consciousness through lack of oxygen when he was thrown clear of the aircraft. In any case he must delay opening his parachute until he has fallen to a height where the air is not so thin.

The new Martin-Baker ejection seat opens the airman's parachute at the correct height automatically. Experiments with the seat have already been carried out in this country and its production for high-speed Service aircraft is under consideration. Tests on the seat are to be carried out in America by the U.S. Navy.

New Basic Trainer for Royal Air Force

The Royal Air Force has ordered a new two-seat basic trainer, the Percival P.56. It has side-by-side seats for instructor and pupil, and there are dual controls —including duplicate hand-wheels for elevator and rudder trimming tabs and duplicate throttle and revolution levers.

The P.56 is an all-metal low-wing monoplane with a fixed undercarriage. The engine is an Armstrong Siddeley Cheetah Mark 17 radial engine of 420 h.p., and later versions may have an Alvis Leonides of increased power.

Servicing the new trainer is simplified by large hinged inspection panels and maintenance can be carried out by semi-skilled personnel without the aid of special tools.

The P.56 will replace the Prentice.

Building up Air Strength

The Society of British Aircraft Constructors state that the output of aircraft under the new defence programme can only be achieved if machine tools and raw materials come in, especially from the United States.

Given these resources, the British Aircraft Industry is ready to push the programme forward as fast as the wheels will turn. Tactical bombers, four-jet high-altitude bombers, and more Coastal Command and Transport Command aircraft will be produced. The interceptor force will be expanded, and increased attention will be given to the production of aircraft for combating submarines.

The de Havilland Venom goes into squadron service this year and even more advanced types of jet fighters have been ordered in large numbers. These will go into production "straight off the drawing board" and will have an improved performance on the high-speed prototype fighters now flying. The night fighter force will be increased with the introduction of the new Gloster Meteor N.F.II.

The four-engined Avro Shackleton long-range search aircraft is already being delivered to Coastal Command and the strength of the Command will be increased. The run-down in the strength of Transport Command has been stopped and new Auxiliary Transport Squadrons organized. More squadrons have been formed in the Middle East and advanced types of aircraft sent both there and to the Far East.

The English Electric Canberra tactical bomber will soon be delivered to Royal Air Force squadrons. U.S.A. has placed orders for this, and several allied nations are expected to adopt it. A new four-jet high-altitude bomber has been ordered off the drawing-board and the prototype will be flying shortly.

New jet aircraft are being built for the Royal Navy: the Vickers Supermarine Attacker and Hawker Sea Hawk jet fighters, the Venom all-weather and night

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fighter. Two carrier-borne turboprop aircraft are in production: the Westland Wyvern strike-fighter and the Fairey 17. The Royal Navy strike squadrons will begin re-equipment with gas-turbine-powered aircraft this year.

When the three-year plan comes to its peak, the annual output of combat aircraft will have been quadrupled. The present international situation makes us wish that this programme had been started three years ago.

Automatic Air "Navigator"

An aerial navigating machine which automatically shows a pilot the position of his aircraft on a map is to go into quantity production. The "navigator" works by moving a pointer across the map. To find out where he is the pilot merely has to look at the pointer: the line which it has drawn shows him his previous track. Its operation is quite independent of atmospheric conditions like wind.

The Flight Log—as it is called—consists of a map fitted in a case about the size of a large cigarette box. The pointer is a stylus pen controlled by radio beams. These beams are sent out by a chain of radio "lighthouses" and a receiver in the aircraft picks up the beams and plots the aircraft's position in relation to them. No tuning is required.

When flying on a medium-length route, the pilot would probably watch a small-scale map giving possible pin-points and distances. As he approached his airfield of destination, he would switch over to a large-scale map of the aerodrome area giving airway approach-lanes and details of other radio and radar aids. If conditions were good the pointer could take him to within 250 yards of the runway. So on a normal medium route, the pilot would use three maps, one of his airfield of departure, one *en route*, and one of his arrival point. This would mean two changes in mid-air, but changing from one map to another normally takes less than three-quarters of a minute.

Electrical impulses mark regular time intervals off on the map so that the pilot can make a quick check of his speed over the ground and his estimated time of arrival at his destination.

Besides showing the pilot where he is and how long it took him to get there, the Flight Log can also help him to fly a regular pattern through the air. Flying these air patterns is part of the complexity of present-day controls for air-traffic, especially when an aircraft is approaching over-crowded airfields, because it is easier to avoid collisions if all aircraft are following a particular course.

"Pilotless" Plane

The new Australian "pilotless" aircraft is the smallest jet machine ever built. The final version, powered by the Armstrong Siddeley Viper, will be capable of flights at very high speeds and high altitudes. It will be the first "expendable" jet engine. They will automatically destroy themselves if hit by anti-aircraft fire or fighter guns. The weight will be 400 lb., with a thrust of 1,500 lb. The engine will be cheap to produce and have a total running "life" of only a few hours.

Women Pilots in R.A.F. Reserve

The pilot section of the W.R.A.F.V.R. was established in 1947, and there are already some fifty members, many of them highly experienced women pilots who served with the Air Transport Auxiliary during the war. The purpose of the section is to provide the R.A.F. with a reserve of women pilots who can be

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[*Air Ministry photo*

The Director of the W.R.A.F., Air Commandant N. M. Salmon, talking to Mrs. Phyllis Jardine, Director of the Malcolm Club, Changi, Far East. Beside the Air Commandant is her Personal Assistant, Flight Officer H. Morris

called upon, in the event of emergency, for non-combatant flying duties, such as the work of ferrying and communications flying.

Young women who are interested in flying and hold a Private Pilot's Licence can now apply to join the W.R.A.F.V.R. as pilots, and, if they are selected, arrangements will be made from them to undergo training at the Reserve Flying Schools which have been set up in various parts of the country. Like many other men and women pilots in the R.A.F. Reserves, they will get their flying experience in their spare time and by attending for a period of a fortnight's continuous training each year.

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[Air Ministry photo

Air Chief Marshal Sir William F. Dickson, K.B.E., C.B., D.S.O., A.F.C., Air Member for Supplies and Organization

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CONCERNING PERSONNEL

ROYAL AIR FORCE PROMOTIONS AND APPOINTMENTS

Among the promotions and appointments announced by the Air Ministry since the issue of the January, 1951, number of this Journal are the following:

Change in Air Council Organization

The equipment and engineering staffs at the Air Ministry have been brought under the control of one Member of the Air Council. The departments of the Air Member for Supply and Organization and the Air Member for Technical Services have therefore been combined.

Under this arrangement Air Chief Marshal Sir William Dickson, K.B.E., C.B., D.S.O., A.F.C., who will retain his present title of Air Member for Supply and Organization, will take charge of Technical Services, comprising repair, maintenance and technical training, in addition to his existing responsibility for organization, works and equipment. He will be assisted by a Controller of Engineering and Equipment, who will be responsible to him for directing and co-ordinating the functions of the Directors-General of Technical Services and Equipment. This post will normally be filled by an officer of the Technical Branch of the Royal Air Force, and the first holder will be Air Vice-Marshal C. W. Weedon, C.B., C.B.E., M.A., A.F.R.Ae.S., who will assume the acting rank of Air Marshal.

SPECIAL APPOINTMENTS

Air Chief Marshal Sir Hugh Saunders, K.C.B., K.B.E., M.C., D.F.C., M.M., as Commander-in-Chief, Air Forces, Western Europe.

Air Chief Marshal Sir James Robb, K.C.B., K.B.E., D.S.O., D.F.C., A.F.C., as Inspector-General of the Royal Air Force.

Air Commodore L. de V. Chisman, D.F.C., to be Vice-President of the Ordnance Board, Ministry of Supply.

AIR MINISTRY

Air Vice-Marshal R. G. Hart, C.B., C.B.E., M.C., as Director-General of Technical Services (II).

Air Commodore H. E. Forrow, C.B., O.B.E., as Director of Technical Training.

Air Commodore S. O. Bufton, C.B., D.F.C., as Director of Weapons.

Air Commodore F. E. Lipscombe, M.R.C.S., L.R.C.P., D.P.H., D.T.M. and H., as Deputy Director-General of Medical Services.

Air Commodore P. B. L. Potter, O.B.E., M.D., Ch.B., D.P.H., D.T.M. and H., as Director of Hygiene and Research.

Air Commodore J. H. Edwardes-Jones, C.B.E., D.F.C., A.F.C., as Director of Plans.

Air Commodore J. M. Cohn, C.B.E., for duty with the Defence Research Policy Committee.

Air Commodore P. S. Blockey, C.B.E., as Director of Technical Plans.

Air Commodore T. U. C. Shirley, C.B.E., as Director of Servicing and Repair.

Air Commodore D. N. Roberts, O.B.E., A.F.C., as Director of Operations (2).

Air Commodore W. J. M. Akerman, C.B.E., as Director of Organization (Establishments).

Air Commodore J. F. Titmas, C.B., C.B.E., as Director of Aeronautical Inspection Services.

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FIGHTER COMMAND

Air Commodore T. C. Dickens, C.B.E., as Assistant Air Officer i/c of Administration at Headquarters, R.A.F. Fighter Command.

Air Commodore R. B. Lees, C.B., C.B.E., D.F.C., A.D.C., to command the Metropolitan Sector.

COASTAL COMMAND

Air Commodore A. F. Hutton, C.B.E., D.F.C., as Senior Technical Staff Officer at Headquarters, Coastal Command.

FLYING TRAINING COMMAND

Air Vice-Marshal J. D. Breakey, C.B., D.F.C., to be Air Officer Commanding No. 21 Group.

Air Commodore G. N. E. Tindal-Carill-Worsley, C.B.E., as Senior Technical Staff Officer at H.Q., Flying Training Command.

BOMBER COMMAND

Air Vice-Marshal Sir Francis J. W. Mellersh, K.B.E., A.F.C., as Air Officer i/c Administration, H.Q., Bomber Command.

Air Commodore H. W. Heslop, C.B., O.B.E., as Senior Technical Staff Officer, H.Q., Bomber Command.

MAINTENANCE COMMAND

Air Vice-Marshal E. C. Farman, C.B.E., as Senior Air Staff Officer at Headquarters, Maintenance Command.

Air Commodore J. Marson, C.B.E., as Air Officer Commanding No. 42 Group.

TECHNICAL TRAINING COMMAND

Air Commodore B. D. Nicholas as Air Officer Commanding No. 27 Group.

Air Commodore J. G. Elton, as Commanding Officer of No. 1 School of Technical Training, Halton.

HOME COMMAND

Air Vice-Marshal W. J. Seward, C.B., C.B.E., as Air Officer Commanding No. 61 (Eastern) Group.

Air Commodore C. W. Gore, O.B.E., as Senior Air Staff Officer, No. 61 (Eastern Group).

IMPERIAL DEFENCE COLLEGE

The following R.A.F. officers are now attending the 1951 Course: Air Commodores C. E. Chilton, H. P. Fraser, J. G. Franks and W. L. Freebody, and Group Captains A. G. Adams, E. C. Bates, D. W. Lane, H. L. Maxwell and K. J. McIntyre.

ROYAL AUXILIARY AIR FORCE

Air Marshal Sir John E. A. Baldwin, K.B.E., C.B., D.S.O., D.L., J.P., as Honorary Air Commodore of No. 3506 (County of Northampton) Fighter Control Unit, Royal Auxiliary Air Force.

Wing Commander P. W. D. Heal, A.F.C., as Officer Commanding, Oxford University Air Squadron.

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MIDDLE EAST

Air Vice-Marshal J. MacC. Kilpatrick, O.B.E., M.B., B.Ch., D.P.H., as Principal Medical Officer at Headquarters, Middle East Air Force.

Air Commodore North Carter, C.B., D.F.C., as Senior Air Staff Officer at No. 205 Group.

B.A.F.O., GERMANY

Air Vice-Marshal J. R. Whitley, C.B., C.B.E., D.S.O., A.F.C., as Air Officer i/c Administration.

FAR EAST

Air Commodore W. A. Opie, C.B.E., to command R.A.F. Maintenance Base, Seletar.

Air Commodore D. W. F. Bonham-Carter, C.B., D.F.C., as Air Officer Commanding, Hong Kong.

Air Commodore G. B. Beardsworth, C.B., as Senior Technical Staff Officer at H.Q., Far East.

RETIREMENTS

Air Marshal Sir Victor Goddard, K.C.B., C.B.E., Air Member for Technical Services.

ROYAL NEW ZEALAND AIR FORCE

APPOINTMENTS

Air Commodore C. E. Kay, C.B.E., D.F.C., as Air Officer Commanding R.N.Z.A.F. Headquarters, London.

Group Captain G. Carter, O.B.E., as Air Member for Supply.

Group Captain R. W. K. Stevens as Assistant Air Member for Personnel.

Wing Commander J. R. S. Agar as Deputy Director of Reserves.

Wing Commander W. D. Abernethy as Assistant Air Member for Supply.

Wing Commander T. F. Gill, D.S.O., as Director of Air Staff Policy and Plans.

Wing Commander A. M. S. Manhire, O.B.E., as Commanding Officer of R.N.Z.A.F. Station, Hobsonville.

Wing Commander J. W. H. Bray as senior air staff liaison officer at R.N.Z.A.F. Headquarters, London.

RETIREMENTS

Air Vice-Marshal Sir Arthur Nevill, K.B.E., C.B., R.N.Z.A.F., as Chief of Air Staff, Royal New Zealand Air Force.

PROMOTIONS

To be Group Captain:

Wing Commander D. W. Baird, A.F.C.
Wing Commander A. B. Greenaway, O.B.E.
Wing Commander B. S. Nicholl.

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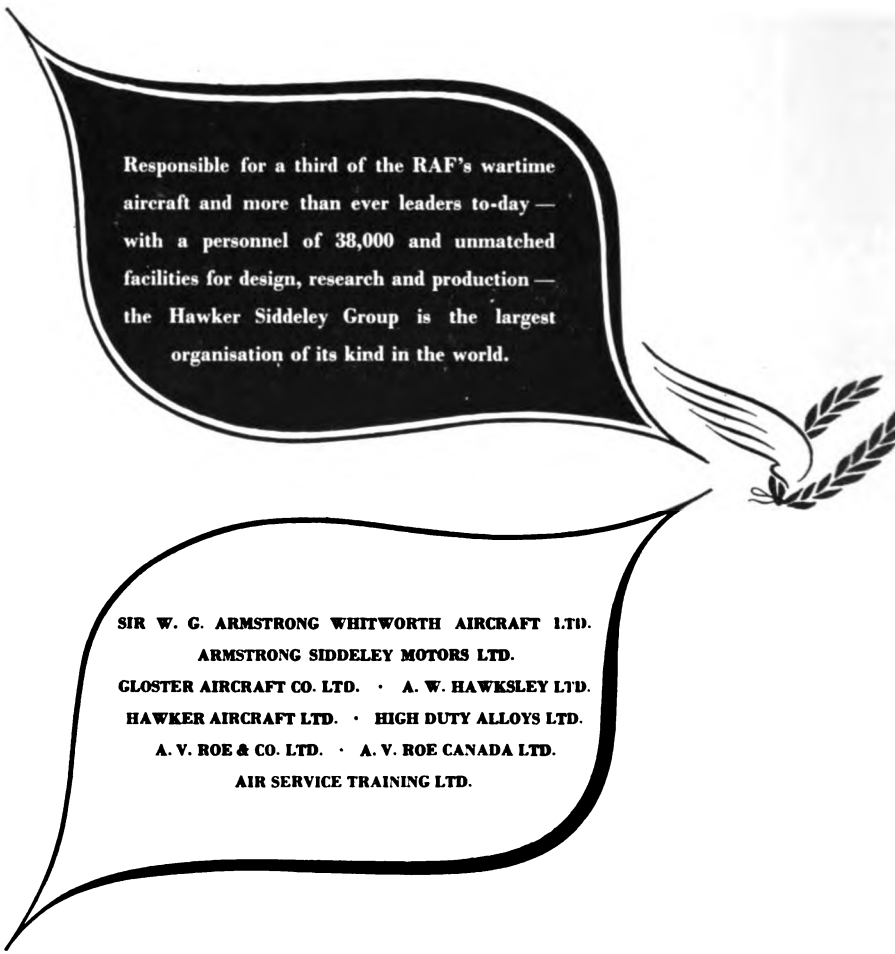
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BOOK REVIEWS

Calculated Risk. By Mark W. Clark, General, U.S. Army. (Harper & Brothers, New York.)

General Clark's book deals with the war in the Mediterranean from the time of the Anglo-American landings in French North Africa to the Axis surrender. He held many appointments, from Deputy Allied Commander-in-Chief, Operation "Torch," to Commander of the Fifteenth Army Group. It is to be expected that he will have much of interest to say, and he does not disappoint. Indeed, he is more than merely interesting; he is stimulating, and provocative, unorthodox in his opinions, and forceful in his expression of them.

For the first time the planning of Operation "Torch" is dealt with in detail. This was General Clark's special duty, and he reveals, more clearly than before, the constant changes of plan. He considers that a mistake was made in not landing farther to the East, at Bone or Bougie, a fact which two British commanders also lament. He tells the full story of his adventures at the villa at Cherchell. The most interesting part of his book dealing with North Africa is his account of the famous Clark-Darlan agreement, which aroused such a storm of protest at the time it was published, both here and in America. He was the man on the spot and he was the most competent man to judge the situation. Any soldier faced with the problem that General Clark was in Algiers would probably have settled it on the same grounds of military expediency. If he had to do the same job over again, he remarks, "I would choose again to deal with the man who could do the job whether it turned out to be Darlan or the Devil himself."

He holds strong views on air matters and the command of air forces. He believes that ground troops cannot be successful in battle unless adequately supported by "combat aviation," and that such planes as are used for this purpose are necessarily auxiliary weapons, and that they should come under the direct orders of the ground commander. He does not consider that the air force can isolate the battle area. Throughout the Italian campaign "I saw this isolation theory tried out again and again. . . . It hurt the enemy without question, but it never kept him from reinforcing or supplying his Italian armies right up to the very end of the war."

Perhaps he is most provocative on the bombing of the Abbey of Monte Cassino, which he says was a mistake. He claims that he said at the time that there was no evidence that the Germans were using the Abbey for military purposes. In his book he declares that "there is irrefutable evidence that no German soldier, except emissaries, was ever inside the monastery." The reader must be left to himself to judge whether his claims are justified or not.

On the subject of the landings in the South of France, he leaves the reader in no doubt as to his views. It was one of the outstanding political mistakes of the war. Viewed in the light of after events, General Clark is undoubtedly right, but for the decision to weaken the Italian front he must blame the preoccupation of his fellow countrymen with the invasion of Europe by the cross-channel route. A Balkans grateful to the Allies for their release from the Germans would have been one less problem for the Allied statesmen of today. In all fairness it ought to be noted that Mr. Churchill realized the importance of the Balkans, but found none to support him.

Critical and objective by turns, at times amusing and forthright, General Clark has made a worthwhile contribution to the growing number of books on the conduct of the war. It is more readable than most, and it adequately expresses the type of person one imagines General Clark to be.

T. M.

The Royal Air Force in the World War, 1940-1945, Vol. IV. By Norman Macmillian, M.C., A.F.C. (Harrap; 15s.)

This volume concludes Captain Macmillian's history of the R.A.F. in the Second World War. It is divided into two parts: Book I deals with the defeat of Germany; while Book II is entitled, "East of Delhi, West of Hong Kong." In the first book he analyses the work of Fighter, Coastal and Bomber Command, and then deals with the contribution the R.A.F. made to the reduction of Hitler's *Festung Europa*. The rest of the book is devoted to the war in the East and the eventual defeat of Japan.

There is no doubt in Captain Macmillian's mind on what are the most important campaigns of the war so far as the Air Force is concerned. The bomber offensive, and the invasion of Europe overshadow anything else. In the controversial matter of the night area bombing of Germany, he states quite clearly the side he agrees with. He points out

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that Bomber Command never had the number of aircraft it required to bomb Germany into submission, and that its efforts were constantly being diverted to helping in the naval war. In retrospect one may claim that it seems wrong to talk of strategic bombing when, in fact, the German fighter force was still in being.

He gives a graphic account of the air forces' part in the invasion of France, and shows how they helped the land forces to defeat the German armies. He is probably at his best when describing the great airborne operations, in Normandy, Arnhem, and the Crossing of the Rhine. His accounts of these operations, objective and sincere, heighten and colour his narrative. He demonstrates that the divided air headquarters was not as successful as it might have been.

The freshest part of the book, however, is his treatment of the Air/Sea War, particularly in the Atlantic. Somehow very little has appeared on the Battle of the Atlantic, but none the less it was a most important part of the work of the R.A.F. Had the Atlantic supply line failed or been cut, the United Kingdom might have found herself in the position of Japan, the destruction of whose merchant fleet, meant her surrender, atomic bomb or no atomic bomb. The difficulties, as he sees them, of Coastal Command, are fully dealt with, and he unerringly puts his finger on one problem, viz., the principle of "offensive air action instead of defensive close escort."

His exposition of the collapse at Singapore makes lamentable reading. The tragedy as he sees it, was that the defence of it was left in naval hands. In 1927 Lord Trenchard had fought the decision to make Singapore a naval responsibility, claiming that it was a matter for air defence. The whole theory of the defence of it was based on false premises; there was no invasion from the sea, and the guns which were to have defended Singapore not only pointed the wrong way but were themselves sunk by air action. In these circumstances, "Those then present were not responsible for what occurred."

Captain Macmillian's quiet style carries one along, all the while imparting knowledge. Naturally, he has not neglected the human element, and his pages record all the V.Cs. won by officers and airmen of the R.A.F. Taken all in all, his book fills the want for as comprehensive and detailed an account that can be had until the official histories are completed.

T. M.

British Test Pilots. By Geoffrey Dorman. 166 pp. Illustrated. (Forbes Robertson Ltd., 143 Fleet Street, London, E.C.4; 8s. 6d.)

Geoffrey Dorman is uniquely qualified to write this "Who's Who of British Test Pilots," as he has flown with most of them, and himself holds licences to pilot aeroplanes, gliders and balloons. His consequent ability to speak to pilots in their own language must have stood him in good stead when compiling his book as, despite what Hollywood would have us believe, few test pilots like to talk in technicolor terms about their experiences, and *British Test Pilots* might well have been as inspiring as a catalogue of spring seeds.

As it is, Mr. Dorman shows that although aeroplanes are no longer made of stick and string, and despite the ability of present-day designers and slide-rule merchants to predict the performance and handling qualities of a new aeroplane, the test pilot's job is just as hazardous and far more demanding than ever. It is no longer sufficient to take off, throw the aeroplane round the sky to make sure the wings will stay on, and then pronounce it O.K. The test pilot of today must be at the same time an airman, engineer and diplomat, for it sometimes requires nearly as much courage to tell a chief designer what is wrong with his new aircraft as to put the latter into a T.V. dive!

Obviously a book such as this must describe the occasional high-lights rather than the monotonous job of production testing, but it is a pity that the author has tried to lend further colour to his story by excessive use of Service slang. Helicopters, for example, are usually referred to as "heli-go-rounds," and aeroplanes become "kites" or "crates." Furthermore, Mr. Dorman should not have criticized on page 22 the Ministry of Supply's reluctance to publish in May, 1948, performance details of the F.86 fighter, which were at that time regarded as secret by the U.S.A.F.

British Test Pilots is, nevertheless, an interesting addition to aviation literature, and leaves no doubt in the mind of the reader that the present generation of pilots is well able to maintain the tremendous reputation of "giants" of the past such as George Bulman, Cyril Uwins and John Lankester Parker. Few who have seen them in action at post-war S.B.A.C. Displays will disagree.

J. W. R. T.

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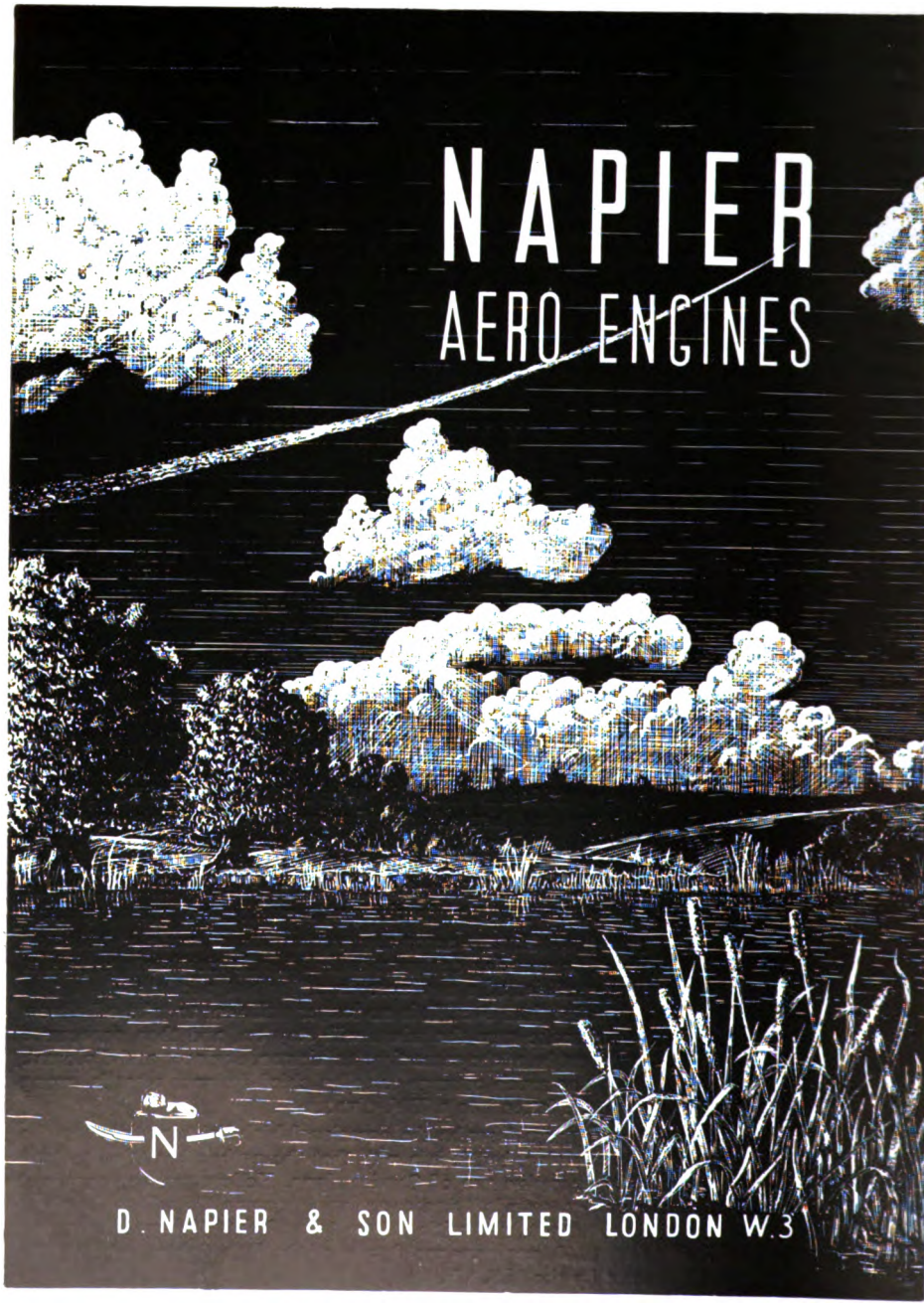

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Air Power: Key to Survival. By Alexander P. de Seversky. 376 pp. Illustrated. (Simon and Schuster, 1230 Sixth Avenue, New York 20, U.S.A.; $3.50.)

When former U.S. Secretary of War Robert P. Patterson released in 1946 Major Seversky's official Report on Pacific Air Power, he commented that "Whatever Major Seversky has to say on air power and its future is worth the attention of all patriotic citizens interested in national defence." No more fitting introduction to Seversky's new book, *Air Power: Key to Survival*, could be written.

The policy it recommends is revolutionary and will not be popular in many quarters. Our continental colleagues will hardly be enthusiastic about the suggestion that the British Isles form probably the only base in the Old World that could be held and used by the Western Powers in a future war. Similarly, the Navy will resent the idea that its aircraft carriers are as obsolete as its late lamented battleships, and the Army will hardly appreciate the suggestion that future wars could be best won without recourse to land fighting. Yet, claims Seversky, concentration on air power at the expense of sea and land power is not merely an easy road to the preservation of peace or survival in war: it is the *only* road.

His arguments are convincing and concern the economics of defence as well as its physical aspects. This is important, for Russia, with its vast resources in men, equipment and territory is a very different proposition to Germany and Japan. If we try to match the Soviet forces man for man, gun for gun and plane for plane it could easily cause the collapse of our whole economic system, paving the way for social unrest and Communism. In which case Russia might well achieve her ambition of world conquest without recourse to a shooting war.

The only solution, says Seversky, is to overcome Russian mass with western technical skill, directing our main effort towards the build-up of an invincible strategic bomber force. In this way, Russia's armies and submarines could be by-passed. Nor would the absence of overseas bases prove critical, for in the giant B-36 America has a bomber of tremendous power, capable of reaching every worth-while target in Russia from bases on the American continent. Once the B-36's had destroyed the heart of the Russian homeland, the Soviet Navy and Army, even if the latter had overrun the whole of Europe and Asia, would be as ineffective as the tentacles of a dead octopus.

So, claims Seversky, America *must* spend two-thirds of her military budget on strategic air power, centred first round the B-36 and later round even more formidable "flying battleships," in which crews will fight aerial battles from armoured control rooms in the heart of the bombers, which will be flown and defended automatically by radar. If such aircraft seem fantastic, it is well to remember that an aeroplane has already been flown over the Atlantic and landed in Britain without a pilot at its controls; guns have already been sighted and fired automatically by radar; and bombs have been dropped accurately on cloud-obscured targets in Germany by personnel in an underground control-room in England.

Obviously, few people will accept unreservedly all Major Seversky's claims, especially now that the war in Korea has proved the continued usefulness of the carrier task force, and the limitations of a strategic bomber force under certain conditions. Furthermore, it would be tragic to put all one's defence eggs into the strategic bombing basket and then discover that Russia had an ultra-efficient target defence interceptor or guided missile that could seek out and destroy B-36's with uncanny accuracy. Remembering Russia's war-time pioneer work in rocket development and the fact that she has countless German missile and aircraft designers working for her, such a possibility cannot be overlooked.

But the important fact remains that *Air Power: Key to Survival* put forwards a *real* strategy at a time when the Atlantic Powers' "balanced forces" are still largely paper ones, and when we seem to be planning for the last war rather than for the next one. We cannot afford a triphibious land-sea-air war on the old pattern either economically or in manpower, and if we try to solve our problems by arming Germany and Japan the antidote may well prove more deadly than the poison. "To make up for inadequate man power in World War II," says Seversky, "we created a Frankenstein monster. Now, in preparing to subdue him if necessary, we are being advised to create two such monsters, again with no assurance that they will not turn against us."

In brief, concludes Major Seversky, it must be understood that "in the formulation of a correct strategy in this unique period there can be no genuine compromise. The correct answer cannot be obtained by averaging opposing viewpoints, any more than surgeons, failing to agree on a diagnosis, can settle the issue by operating on some in-between part of the anatomy. A strategy is either right or wrong—and we can't risk being wrong." Nor can we afford to ignore this book.

J. W. R. T.

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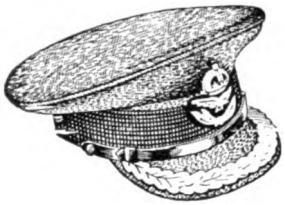

THE BRASS HAT

A Staff Officers' Guide

By

Group Captain A. H. Stradling
O.B.E., R.A.F. (Retd.)

Author of "Customs of the Services"
Editor of "The R.A.F. Quarterly"

The purpose of this book is to offer, from practical experience gained in both the Army and the Royal Air Force by the author, some useful guidance to comparatively Junior Staff Officers and those likely to be appointed to Staff duties.

The book is primarily written for the Royal Air Force, but it is equally applicable to the Army, and all Staff Officers will find much of interest and value to them in its pages.

Experience gained in over 20 years' service in a number of Staff appointments in both Services has resulted in the production of this book, which is one of guidance and hints to Staff Officers, in particular those of the Royal Air Force.

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The Brass Hat—a Staff Officers' Guide. By Group Captain A. H. Stradling, O.B.E., R.A.F. (Ret.). 112 pp. Illustrated. (Gale & Polden Ltd., The Wellington Press, Aldershot, Hants; 6s.)

There are good staff officers, bad staff officers and indifferent staff officers, and one meets them all in this little book. Its object, according to the preface, is to "offer useful guidance to comparatively junior staff officers and those likely to be appointed to staff duties," but it deserves a wider readership than that. Sections such as that describing the first things an officer should do on arrival at H.Q. are obviously of most use to the "new boy," but plenty of experienced officers would benefit from reading the chapters on "Précis Writing" and "Lecturing," which are crammed full of sound common sense and good advice.

Nor is *The Brass Hat* of use only to officers of the Royal Air Force. With a few exceptions, it is equally applicable to the Army, and many of its lessons could well be taken to heart by executives in the civilian world of "Big Business," for the author's list of eight essential qualifications needed by a staff officer—complete loyalty to his chief, common sense and intelligence, ability to be a good mixer, willingness to serve, judgment, an open and receptive mind, a sound knowledge of his job and personal neatness—are the essentials for efficiency and success in any walk of life.

Group Captain Stradling's suggestions and advice, which are based on over twenty years' personal experience of staff work in the Army and Royal Air Force, are brief and very much to the point; but that does not mean that they are sketchy. He has packed a surprising amount of detailed advice in a small book, even to the extent of providing specimen charts of the type he recommends new officers to prepare to assist them in their duties. He makes good use of humour in both text and illustrations, but it is humour with a punch, emphasizing in each case a point that he wishes to make doubly clear.

It would be foolish to pretend that a bad staff officer can become a good one simply by following implicitly the advice given in *The Brass Hat*, but there is no doubt that it can be a big help, and few officers are so perfect that they would not benefit from buying a copy—and reading it!

J. W. R. T.

The World Rebuilt. By Peter Howard. 232 pp. (Blandford Press, London; 2s. 6d. net.)

On 22nd February, 1951, Lord Ismay stated in the House of Lords: "We are confronted by the gravest peril in our history, but . . . I am convinced we can overcome it provided we are resolute, vigilant and, *above all, united*." Few people will disagree with this statement or deny that there is grave disunity, internally and internationally among the free countries of the world, including Britain and the Empire. But how are we to achieve unity, and what is to be that uniting idea that will inspire and weld into a homogeneous fighting force this country and its allies, including the Germans, Italians and Japanese?

A moment's examination of the free countries of the world shows that this uniting idea or force must be world-wide and above class, creed, race, sect and colour. It must be simple, effective and, in our present crisis, quick. These are no days for bright ideas or theories. We need something of proven and tested worth, and here, in Mr. Howard's latest book, we have it.

Mr. Howard, well-known international rugby footballer and political columnist, tells us in *The World Rebuilt* of the achievements of Moral Rearmament in the Cabinets, factories and homes of Europe; in the armed forces in Germany, the East and Africa. He tells of industrial unity and victory over the well-organized subversive forces operating on a global scale to control the docks, mines and factories of the world. He tells of Marxists and Communists won to a new and better idea. To those who see no alternative to Communism except war this book offers a second alternative, Moral Rearmament, and gives the true story of the work of this force throughout the world. The enemy of the day is materialism, of which Communism, or dialectical materialism, is only an offshoot.

From this book it would seem that there only two effective contestants for control of the world—Communism and Moral Rearmament; each involves a revolution, one materialistic, the other Christian. Moral Rearmament gives every man the chance to join in the fight and change things for the better.

The only thing the Kremlin fears is a strong moral force in a united Europe; this book gives evidence of such a uniting force and must be read by all who seek the secret of victory in the cold war, or any hot war, for unless we win the former we will have no weapons, or heart, to fight the latter.

P. I. H.

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Wings for Tomorrow. By John W. R. Taylor and Maurice F. Allward. 112 pp. Illustrated. (Ian Allan Ltd., London; 7s. 6d. net.)

This book is published at an opportune moment, when a lively controversy is taking place, not only in our flying services but among all interested in our defence, upon the merits of the flying-boat in war, particularly in combating the submarine menace.

The authors are unbiased in their arguments and show a very full knowledge of the capabilities and limitations of this now sadly neglected arm of our defence. The earlier chapters deal with the birth of the flying-boat, its development and how we reached the acme of superiority over all others in the Short production of a four-engined all-metal boat.

They are forthright in their condemnation of the operators who have, shortsightedly, forsaken them and all that this might mean in its adverse effect on our defence, should war come before a change of heart gives us back this essential weapon, for co-operation with carrier-borne aircraft in dealing with the masses of modern submarines now being built up with so sinister a purpose by the Russians.

Chapter 9 is particularly interesting. It covers the reason "why" we require flying boats.

Not only is the military aspect dealt with, but forceful arguments are given for their development by operators in peace time. When the great "Princess" has completed her trials and is in commercial use, we expect to see the authors' views vindicated.

This very interesting book makes out a good case for the inclusion of flying-boat development in our long-term planning, if Britain is to maintain her world superiority in air-liner design, and holds great hopes that flying-boats will be included in our "Wings for Tomorrow."

A. H. S.

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Wings for Tomorrow (with an appendix of British Flying Boats, Details and Dimensions). By John W. R. Taylor and Maurice F. Allward. 112 pp. Fully illustrated. (Ian Allan Ltd.; 7s. 6d. net; 1951.)

The Brass Hat. (Hints to Staff Officers, with illustrations of a light character.) By Group Captain A. H. Stradling, O.B.E., R.A.F. (retd.), author of "Customs of the Services." 112 pp. (Gale & Polden Ltd., Aldershot; 6s. net; 1951.)

DEFENCE

Defence in the Cold War—The Task for the Free World. Report by a Chatham House Study Group—Chairman, Major-General Sir Ian Jacob. 123 pp. (Royal Institute of International Affairs; 1950.)

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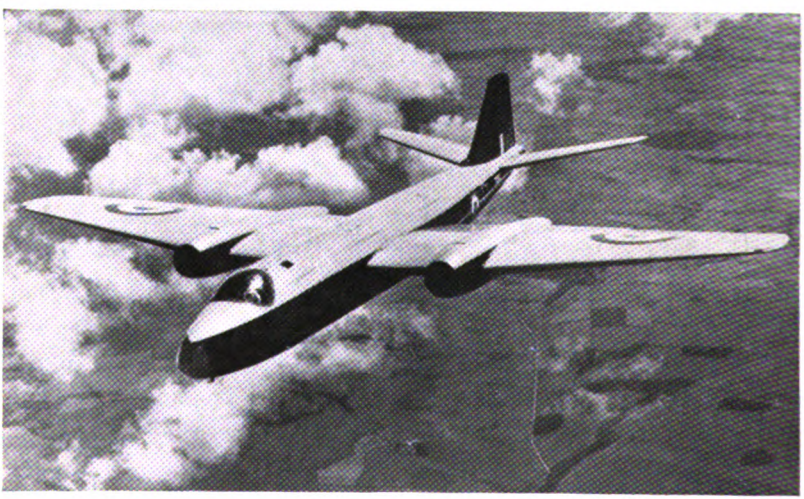

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EDITOR
GROUP CAPTAIN A. H. STRADLING, O.B.E., R.A.F. (RET.)

Assisted by an Air Ministry Advisory Committee of members of the Royal Air Force and Air Forces of the Commonwealth

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EDITOR.

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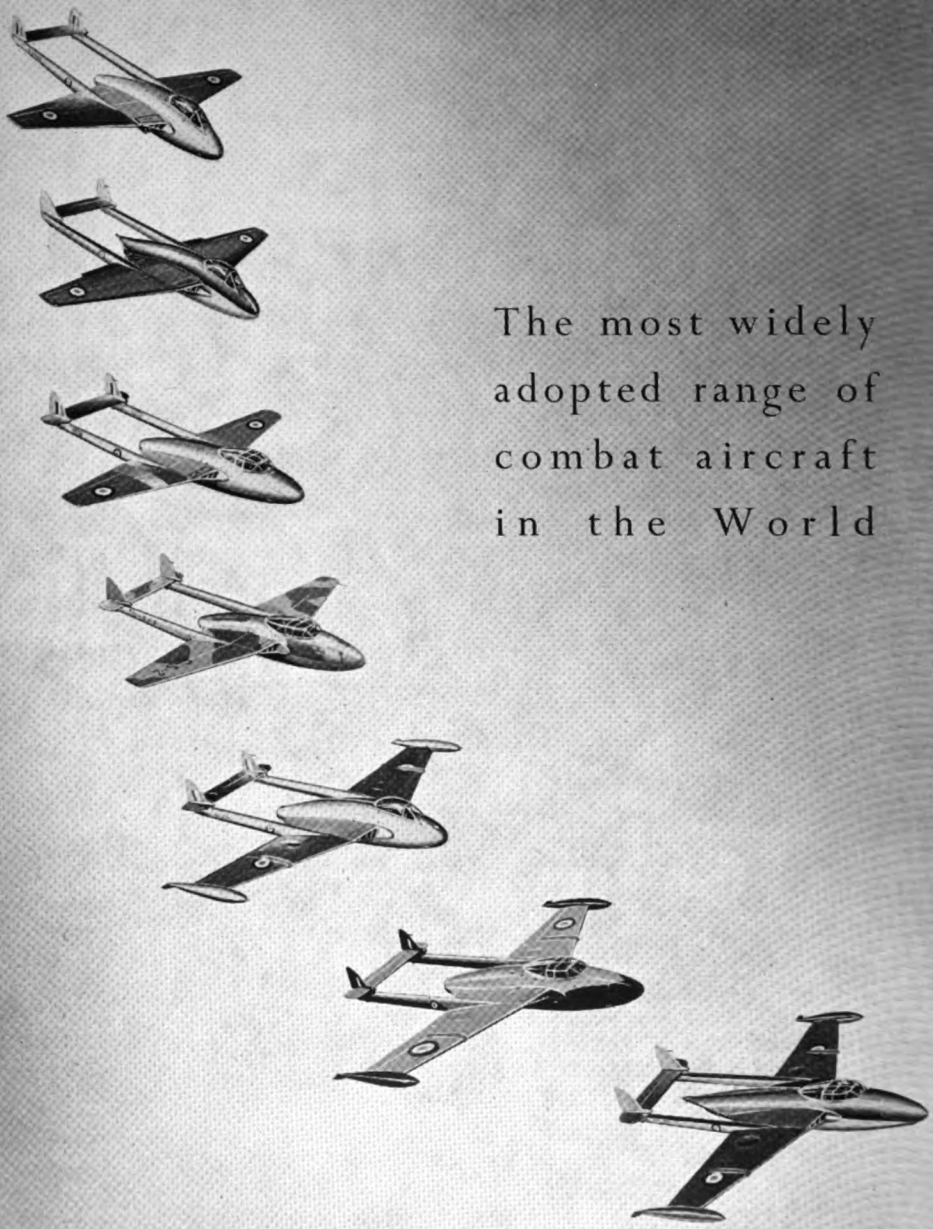

The most widely adopted range of combat aircraft in the World

DE HAVILLAND FIGHTERS

powered by de Havilland turbines

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["New Zealand Herald" Photo

LATE AFTERNOON IN THE BAY OF PLENTY, NEW ZEALAND

This unusual picture was obtained from the blister of an R.N.Z.A.F. Catalina, during the recent large-scale search of New Zealand waters for missing yachtsmen. Partially framed by the port wing and fuselage is volcanic White Island, in the Bay of Plenty. A New Zealand landmark, White Island is formed by the summit of a volcanic mountain rising out of the water. The crater is occupied by a lake of strong mineral water, fed by intermittent geysers and boiling springs surrounding it. Four miles in circumference, and 1075 feet high, the island is in fact yellow and not white. It erupted in 1914 and workers in the sulphur mines were entombed. Today it is not inhabited, the sulphur mining having been abandoned.

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EDITORIAL

AIR POWER MISJUDGED—KOREAN OPERATIONS

THE effectiveness of air power in modern war has recently been sharply criticized in some unenlightened quarters.

Without adequate knowledge of the principles of the use of air power in war, these critics have drawn attention in the Press to the unchallenged freedom of the skies enjoyed by the United Nations' Air Forces in Korea, to the seemingly small influence this has had on operations, and have arrived at the fallacious conclusion that the effect of command of the air in modern war has been considerably exaggerated.

Most people are unfamiliar with the proper use of air power in war, having had little occasion to study this problem. It is, therefore, dangerous to allow such faulty conclusions to go unchallenged.

For carefully considered reasons, such as the danger of falling into the Communist trap of becoming involved in a large-scale war against China, or the possibility of starting a Third World War, certain restrictions have been placed upon the use of air power in Korea. These have had the effect of considerably reducing its usefulness, if not actually hamstringing our air forces. One might as well adversely criticize the world's heavy-weight champion when, with one arm tied behind his back and the places where he could succeed most, such as the point of the chin and the solar plexus having been placed out of bounds, he fails to knock out his opponent. Air power to defeat an enemy must be allowed to strike him where it does the most damage—the destruction of his means of production, his bases and the lines of communication by which his forces are maintained.

Tactical use of our air forces has been of invaluable help to our ground troops, and no one will deny that our airmen have done a grand job of work in this respect, but denied its most important role (strategical use) a repetition of the defeat of Germany by air power cannot be achieved. As long as the strategic components of the Communist forces in Korea are located in Chinese territory and, for reasons stated earlier, immune from attack, air power cannot be put to its proper use or produce that defeat of the enemy that it would otherwise undoubtedly achieve. The air force is a formidable two-handed fighter and, although deprived of the use of one hand, the airmen of the United Nations' Air Forces have put up a magnificent fight and well maintained the high reputation that our air forces have established.

Such criticism as there has been was ill-founded, mischievous and misleading. Air power is still the deciding factor in modern war unless it is "hamstrung" for political reasons. Under existing conditions our air forces will no doubt continue to play a very large part in the present strategy of destroying on Korean soil as many as possible of the enemy's forces, lowering China's morale and obliterating a large part of her trained regular forces.

IS BRITAIN OVER TACTFUL?

We certainly are tactful, even to the extent of suffering from a large dose of "over tactfulness." British observance of the "niceties" for a long time must have caused a good deal of satisfaction, if not amusement, in the Kremlin. (Are we being tactless, ought we to have said "elsewhere"?)

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It was but a short while ago that obscure remarks such as "a potential enemy" had to be used, in case some sensitive person might think we were referring to some great power in particular. The absurdity of this was obvious, as everyone knew that such veiled references referred to Russia. On the other hand, Stalin cares nothing for the sensitiveness of other powers; he states openly that Communist ideology necessitates bringing the free peoples of the world (Imperialist States) under Russian dictatorship and that he intends to do this by force of military might. He says: "The existence of the Soviet Republic side by side with Imperialist States for a long time is unthinkable. One or the other must triumph in the end and before that end supervenes a series of frightful collisions between the Soviet Republic and Bourgeois States *will be inevitable.*" If elaboration of such a clearly defined intention were necessary, we have only to look at the overwhelming powerful military might that he is gathering together ready for the moment he considers propitious for his attack.

Under such conditions do we need polite excuses for hastily arming ouselves to the best of our ability? There is not a sane man in this country who does not earnestly wish for peace, but is it not wishful thinking to say that we do not believe that war is inevitable? Is it sound policy and in the nation's best interests to do so under present circumstances? Because it is abundantly clear that the man in the street is still quite unaware of the real gravity of the situation.

Being a non-political journal, we do not wish to be misunderstood when we suggest that the leaders of every political party should speak plainly to their followers and urge upon them the necessity to give every possible aid to our defence programme.

The Air Force still needs men of the right *quality* and in the right numbers to fly their aircraft and do the multitudinous technical jobs on the ground that are required in these days to keep our very complex modern aircraft and equipment serviceable. We are still not getting enough young men of the right quality for our aircrew. At such a crisis in our nation's affairs this is serious. The Royal Air Force is now our first line of defence; it has the respect of every nation in the world and traditions second to none. Let parents, schoolmasters and others in a position to influence youth see to it that these traditions are maintained and play their part in the defence of this realm by seeing that suitable boys offer their services to the world's finest Air Force.

Looking farther afield, having come into the open and admitted from every rostrum in the country the threat from Russia, would it not be as well to be equally open in rallying every free and independent power to our aid? Is it not a fact that the most vital part of our air power, the Strategic Bomber Force, must be provided by the U.S.A.F.? That it cannot successfully operate from American bases? That Turkey and Greece, as members of the North Atlantic Pact, would give us facilities for vital bases?

Let us be tactful by all means, but not to an extent which clearly endangers our Gibraltar—Alexandria sea route and the oil lands of the Middle East. With the present state of affairs in Persia it becomes more imperative than ever that we should drop politeness and show clearly that all free peoples of the world intend to unite in defending themselves if one or more of them are attacked by any "potential enemy."

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AIR POWER ROUND THE SOVIET

By Michael Mallett

TO get some real idea of the effect of air power on defence strategy we must forget the old flat mercator maps and see the land mass of the world spread on a global projection. Looking at the global picture, we can see that there is a ring of air bases stretching round the Soviet Union. The ring runs through Alaska, across America, through Western Europe and the Mediterranean bases, on through the Middle East and Singapore, then via Japan and across the Pacific back to Alaska.

This ring of advanced air bases is backed by the productive capacity of the free nations—a capacity which is considerably greater than that of the Soviet Union. That fact was behind Mr. Bevan's statement that no nation "however large its manpower would coldly contemplate launching 25 m. tons of steel per annum against the combination of 140 m. tons per annum." But how rapidly and how effectively is this raw material being turned into weapons of war?

The answer to that question is a very different one today from what it would have been twelve months ago. At that time Russia had piled up a fully equipped air force, while the air forces of the West were deficient in men and machines. In all types of aircraft the West had designs superior to those of Russia, but they were in the prototype, not production, form. In addition, both Britain and America, for reasons of economy, sometimes "skipped a stage" in design. Britain, for example, built no pressurized piston-engined bomber but has used the American B.29. America has no aircraft in the stage of development of the Canberra—and consequently, has ordered it into production under licence. This "leap-frogging" of design is a game played when money is short. With big bomber prototypes costing perhaps a million pounds each it may be an inevitable game but at the same time it is a risky one.

Today the leap-frog game is temporarily over. Both Britain and America are putting their best machines into production. Britain's effort is directed at a three-year production programme, reaching its peak in 1954, to include four-jet bombers, tactical bombers, jet fighters, night fighters, training aircraft, anti-submarine and Coastal Command aircraft. The point to remember is that only a few of these aircraft will begin to be delivered to squadrons this year; big-scale delivery will not be under way until at least 1952-53. If there is any relaxation of political pressure which causes a relaxation of productive effort, this modernization may take even longer.

THE "ALLIES"

Britain's new production effort has to be looked at in the framework of the N.A.T.O. and Commonwealth air forces and their ring of bases around the Soviet Union. It is important that there should be co-operation and standardization between them. First, there must be standardization of equipment. The standard fighters, the Vampire and the Meteor, are both widely used in the West. The Vampire is in service with twelve different foreign air forces and the Meteor with six. Some of these countries are building British jet engines and aircraft in their factories under licence for expanding their own air forces and those of neighbouring powers.

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THE LAND MASS OF THE WORLD SPREAD ON A GLOBAL PROJECTION

Recently some of the N.A.T.O. countries have begun to take delivery of American jet fighters, mainly F.84 Thunderjets. This boost to the strength of the forward Atlantic defence line is all to the good—but it has the disadvantage of complicating the standardization of equipment and technique, of complicating the supply of spares and of imposing problems of maintenance.

WESTERN AIR DEFENCE

Standardization of the air forces of the West began in earnest in January, 1949, nearly a year after the signing of the Brussels Pact. Air Headquarters were set up at Fontainebleau under Air Marshal Sir James Robb. Since then air exercises like "Cupola" have shown how far that co-operation has gone. One obvious deficiency is that it consists purely of a *defensive* force. This defensive set-up comprises day and night fighter squadrons and also the control, radar and anti-aircraft units. The air forces have adopted as standard the British system of controlling and directing fighters from the ground and all orders to pilots are given in English.

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A harmonized anti-aircraft procedure has reached the stage where an anti-aircraft unit from one country can work under the control of an ops. room run by another power. Finally, to ensure a uniform standard of efficiency and a common technique, a combined training unit is now in being.

THE R.A.F.'S PART

The task of the air forces of the West is four-fold. It is:

1. To defend us from invasion.
2. To protect our sea and air communications.
3. To support any land forces we may send from Europe.
4. To strike at the heart of the enemy's industry.

Roles 1 and 2 are *defensive*, roles 3 and 4 are *offensive*. The Western air forces serve mainly in the defensive role. The part played by the Royal Air Force consists of a fighter force in the United Kingdom and Germany backed by a ground radar chain. The radar chain is not yet complete and it is not known how deeply it penetrates into Soviet territory. Improvements are being made. Fighter Command, which had been on half-flight basis due to shortage of skilled maintenance, is now being brought up to strength and expanded still farther. The number of squadrons and machines is secret, but probably numbers hundreds rather than thousands. All we know about it is that the "front-line strength," including overseas squadrons, is greater than it was in 1939.

The R.A.F.'s standard fighter planes, the Vampire and Meteor, are now some years old. But both aircraft are fully tried and tested types and could put up a performance at least as good as that of their American counterparts which have shot down Russian jet fighters in Korea. The Venom, coming into squadron service this year, has a considerably improved performance on both as an interceptor, and should be fast enough on the climb to intercept any bomber in production. Nevertheless, it is good to know that still more advanced fighters have been ordered off the drawing-board—and these will have a better performance than the fastest jet prototype fighters now flying. But it may be as much as two years before these new fighters reach the squadrons.

The main defect of present-day fighters is their armament. The Vampire and the Meteor have four 20-mm. cannon fitted in the nose. Standard American fighters, which need improvement, use six 0.5-inch. guns. But many types of Russian fighters are believed to have 30-mm. cannon.

New photo-reconnaissance fighters are needed. Back in 1938, General Von Fritsch, of Germany, said that the military organization with the most efficient photographic reconnaissance would win the next war. Today the Spitfires and Mosquitos which won that war are slowly being replaced by the new Gloster Meteor F.R.9 and P.R.10. A photo-reconnaissance version of the Canberra is also to be ordered.

Jet night fighters will go into service this year, but it is doubtful if they are available in anything like the number necessary to police the night skies of Western Europe—less still the complete circumference of the air ring round the Soviet. The R.A.F. has ordered the twin-engined Meteor N.F.11 night fighter, a very high-performance machine with probably great range but less manœuvrability than the single-engined Venom N.F. The Venom N.F.2 has also been ordered for the Royal Navy as an all-weather and night fighter. Probably the best all-weather and night fighter at present in production is the heavy radar-equipped C.F.100 built in Canada. The C.F.100 has two Avon engines which give it an outstanding range and performance, particularly for over-the-Pole defence. There

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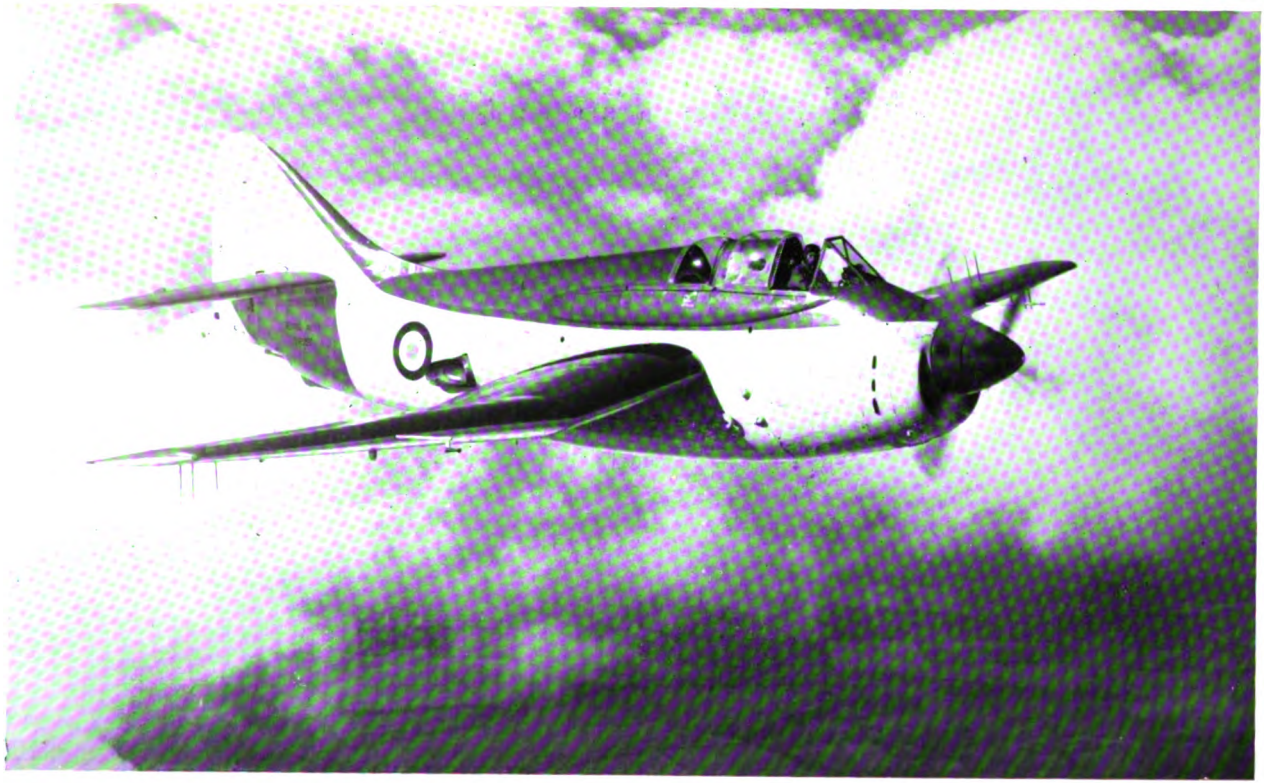

THE FAIREY 17

Latest flying photograph of the Fairey 17 *Anti-submarine aircraft, powered by an Armstrong Siddeley "Double Mamba" twin co-axial turbine engine, driving contra-rotating propellers. This aircraft, designed for the Royal Navy, is now contemplating constructors' trials, after recently passing all deck landing tests.*

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have been reports that it might be made available to the U.S.A.F. and also the Royal Air Force. Here again slowness of production may cause difficulties.

Britain's weakness in current jet fighters shows itself particularly in the squadrons of the Auxiliary Air Force. Most of these squadrons are now equipped with jets, but many of them are out-of-date marks—like Meteor 4's—which have already been flown for many hundreds of hours. The squadrons are also under strength in the sense that many of them have more pilots than aircraft; they are equipped on a "one-flight" basis.

The other half of the *defensive force*—the anti-submarine force—is equally important to the defence of Britain. Since the war, Coastal Command squadrons have been allowed to run down to an insignificant strength, but are slowly being built up with the new Shackleton shore-based, long-range search aircraft. They will also be reinforced with long-range Neptune reconnaissance aircraft obtained from America.

The Navy's new carrier-based anti-submarine turboprop aircraft, the Fairey 17, is now on order, but it may be eighteen months before large-scale deliveries begin. In the meantime, the Navy can operate the piston-engined Firefly (equipped with sonobuoys) and, when it gets them, its long-range Wyvern strike-fighters. Neither of these aircraft carries the radar equipment of the 17. One more important naval type is the helicopter. Helicopter trials carried out in the Channel early this year on a small naval vessel may lead to every merchant ship having its own helicopter flight deck. The standard Navy Dragonfly helicopter is designed only for reconnaissance work, but bigger helicopters now under development may be used in the strike, as well as a search, role.

THE OFFENSIVE ROLE

The offensive air power of the West—its power to strike at targets—leaves much to be desired. America's punch was softened by reliance on the efficacy of the atom bomb; Britain's by failure to produce an advanced type of piston-engined bomber. Both these two arsenals of air power virtually relaxed development of the strike arm until the Korean campaign jerked them into life.

The run-down of the bomber and transport force was paralleled by a lack of adequate aircraft for supporting ground forces. Korea showed how vital the ground-support aircraft is. It also showed that piston-engined fighters taken out of moth-balls have only a limited use in a limited campaign. Jets are needed. It is true that with their high fuel consumption they only have a short time over the target. But if the target is properly identified for them, then twenty minutes' combat time is adequate.

Both the Vampire and the Meteor are excellent machines for troop support. The Vampire (the standard aircraft for this work) can operate from small advanced airfields and difficult terrain like the grass airfields of Switzerland. It has a fire power equivalent to the broadside of a destroyer. Both machines have been tested in Germany, and, being tried and developed types, have excellent manœuvrability and make a steady gun-platform. The F.84 Thunderjet now being delivered to some Western countries under M.D.A.P. is unsuitable as an interceptor (with extra fuel tanks it takes twenty minutes to reach 30,000 feet), but it is useful for troop-support work. It is slower than the Vampire, but has a greater endurance. Squadrons of F.84's are also stationed in Britain in support of the U.S.A.F.'s B.29 and B.50 Bomber Squadrons.

Equally important in the strategy of *offensive* power is the Transport Force. "Air-lift" (as it is called) won the last war and the Berlin crisis. Britain's Trans-

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THE ENGLISH ELECTRIC CANBERRA MK. 2 BOMBER
powered by two Rolls-Royce Avon jet engines

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port Command was drastically cut following the devaluation crisis in 1949, and though those cuts have since been restorted there are still bad gaps. Its present equipment is Valetta and Hastings troop and supply carriers, some of which are also operated as auxiliary squadrons by the charter companies. In time of war, the heavy civil transports operated by the Aircraft Corporations would presumably bolster up the strength. But the R.A.F. has no large freighter (even the small Bristol Freighter was never ordered), and if it is to be an efficient "lift" force capable of moving a couple of divisions with their equipment, it needs big, heavily constructed "box-car" transport with front and rear clam-shell doors for loading heavy vehicles.

R.A.F. Transport Command are also to take over the Princess flying-boats now being built at Cowes, Isle of Wight—its first operational flying-boat since the Sunderland. A new type of flying-boat is clearly needed if the Empire supply routes are to be kept open in times of emergency, but while manufacturers have designs on the drawing boards, no order has yet been placed. Service apathy to the flying-boat has also shown itself in the rejection of the jet-propelled sea-based fighters.

The bomber force of the Western Air Forces is the arm most often criticized—advanced types of long-range bombers are non-existent. American ten-engined bombers (with mixed jet and piston power-plants) are being built in quantity, but they will not be supplied to European air forces. A British four-engined heavy bomber has now been ordered, but it may well be two years before delivery to the squadrons begins.

In the interval, the Western heavy-bomber force consists of R.A.F. Lincolns and seventy American B.29's, backed up by American squadrons of B.29 and B.50 bombers based in the United Kingdom.

In addition, the Western Air Forces are to have a large number of squadrons of Canberra tactical bombers, the first of which will be formed in Britain this year. It is clear that if it became necessary to launch a full-scale attack on the enemy industrial area—with or without atom bombs—the Western Air Forces would have to rely on America. If the American bombers were deployed elsewhere, the West would be without a strike force. In fact, the sooner the R.A.F. takes delivery of its own heavy bombers the better for Europe.

THE AIR RING ROUND THE SOVIET

The R.A.F.

Small R.A.F. Fighter and Transport Units in Germany, the Middle East and the Far East can be considered as little more than "police units" in their zones. They do, however, provide the necessary administrative set-up for rapid expansion from home commands if necessary. Dovetailed in with these R.A.F. squadrons will be the U.S.A.A.F. aircraft operating from the string of bases they are opening in North Africa and the Near East.

Western Air Forces

Most of the European countries have a force of out-dated piston-engined fighters and a small nucleus of British jets. The piston-engined types would be useful for ground support work, backed up by the American Thunderjets being added under M.D.A.P. The significant deficiencies are in night fighters and interceptors, and in radar equipment; this applies even in Sweden, which has the third largest and the best-equipped air force in Europe.

Europe's air forces depend mainly on the production capacity of the United

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Kingdom. There are a few exceptions. Belgium and Holland are beginning to build Meteors. France is manufacturing Vampire 5's and the Ouragan 600-mile-an-hour fighter. Hispano-Suiza, the engine company, are producing the Rolls-Royce Nene under licence and eventually hope to turn out thirty a month. The Italians hold a licence to build Ghost engines and Venon airframes, though production is at present minute. The Swiss (though not members of the Atlantic Pact) hold similar licences and have 120 jet and piston fighters in service. All these production programmes are at present insignificant, though they can be expected to gather momentum in the coming months. The one exception is Sweden. Though (like Switzerland) not a N.A.T.O. signatory, the Swedes have 1,000 to 1,500 first-line aircraft including 200 Vampires and increasing numbers of their own S.A.A.B. jet fighters powered by Ghost engines.

RUSSIAN STRENGTH

Informed opinion suggests that the West is in a far better position in relation to Russia—"air-wise"—than is often assumed. The maximum potential production *capacity* of the United States, Britain and Europe is greater than that of Russia. But if a war were launched tomorrow, the Soviet would give the West a hard initial punch. Soviet air power is believed to be organized into ten to fifteen air armies totalling, with transports and trainers, between 18,000 and 20,000 aircraft. These air armies are mainly tactical. In addition, the Soviet has a few hundred B.29-type strategic bombers under the command of the navy. Russia's principal assets are the help obtained from captured German designers and the jet engines she bought from Britain in 1947. Her tendency to concentrate on production of a few rugged types rather than dispersal of effort on a quantity of prototypes might well turn out to be an asset of some importance.

The main Soviet deficits are lack of experience in strategic bombing, in radar and other technical know-how. Her military leaders, too, are over-conscious of the *tactical* value of air power and have little sense of strategic logistics.

These assets and faults are both well exemplified and symbolized in the little that is known about the MiG-15, the Soviet jet, *vis-à-vis* its opponent, the American F-86 Sabre. Both aircraft are based on a German design and are very similar. The MiG is in large-scale use in Germany and China, but is piloted badly. It is probably not quite as fast as the Sabre but is better armed. It is of rugged design but lacks the radar and radio equipment of the Sabre. In Korea the MiG has been shot down by slower aircraft. To sum up—it is a good fighter and it is in large-scale production. But in two years' time the Western Air Forces should be able to face it (and its successors) with confidence. This assessment of MiG versus Sabre might be held to symbolize the air power of the opposing powers.

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THE INTERNATIONAL SITUATION

By Wing Commander R. F. Pemberton, M.C., T.D.

WITH the national rearmament programme launched and the expansion and re-equipping of the Royal Air Force well under way, Service interest in Parliament has shifted outwards again to strategical considerations: to recent developments in the North Atlantic Treaty Organization and to the international situation generally.

THE NORTH ATLANTIC TREATY ORGANIZATION

The higher military organization of the North Atlantic Treaty Organization and its System of Command were described in a White Paper (Cmd. 8214: H.M.S.O., 6d.) presented to Parliament by His Majesty's Government on 17th April last.

At the head of the military organization stands the Defence Committee, consisting of the Defence Ministers of the twelve Powers associated in the North Atlantic Treaty, with their Chiefs of Staff forming a Military Committee directly responsible to the Defence Committee. Immediately below, and responsible to, the Military Committee are the Standing Group (consisting of the Chiefs of Staff of France, the United Kingdom and the United States) and the Military Representatives Committee (consisting of the Chiefs of Staff of *all* the North Atlantic Treaty Powers), both normally working through their Permanent Representatives. The Standing Group, being a small compact body of experts, would give general strategic direction in the event of war, co-ordination being ensured by the parallel Military Representatives Committee and by the Military Committee itself. The Standing Group therefore takes its place at the head of the system of command.

Directly responsible to the Standing Group are the Supreme Allied Commander Atlantic, the Supreme Allied Commander Europe and the Commander of another Command (probably for the Middle East and Mediterranean) not yet determined. The Supreme Allied Commander Atlantic (Admiral W. Fechteler of the United States Navy) will have a British Admiral as Deputy Supreme Commander and two Area Commanders-in-Chief: a British Admiral for the Eastern Area and an American Admiral for the Western Area. The Supreme Allied Commander Europe (General of the Army Dwight D. Eisenhower) has, as his Deputy Supreme Allied Commander, Field-Marshal Viscount Montgomery of Alamein, a Deputy (Navy), Admiral André Lemonnier, and a Deputy (Air), Air Chief Marshal Sir Hugh Saunders, R.A.F.

The Supreme Command Europe is sub-divided into three sectors. The *Northern Sector*, including Norway and Denmark and their adjacent waters, has a Commander-in-Chief (Admiral Sir Patrick Brind, R.N.), under whom are two Commanders of Land Forces (for Norway and Denmark respectively) and a Commander of Allied Air Forces (an American). The *Central Sector*, which is directly controlled by the Supreme Commander Europe, has a Commander-in-Chief, Allied Land Forces (General A. Juin, of France), a Commander-in-Chief, Allied Air Forces (Lieutenant-General I. Norstad, of the U.S.A.) and a Flag Officer Central Europe (Vice-Admiral R. Jaujard, of France). The *Southern*

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Sector, which will include Italy, is not yet determined, but it is expected that its Commander-in-Chief will be an Admiral (owing to the importance of the Mediterranean in this sector) and that its Commander of Land Forces will be an Italian.

Thus is deployed the command organization of the Western Powers, now preparing to defend their liberties against the manifest threat from the East. It may be called the bare bones of defence ready to be clothed with the flesh and blood of troops and ships and aircraft, of munitions and supplies, that alone can make it effective. This clothing process is now going on in the United States of America, in France, in Britain and in the other nine countries that are members of the North Atlantic Treaty Organization, generously helped from the wealth and resources of the first and predominant member.

THE INTERNATIONAL SITUATION

And now, what of the international situation that necessitates all this array of armed might? It is grim. There is general uneasiness everywhere. It is like a sinister background to all the principal debates in Parliament on major issues, even those not directly connected with foreign policy and defence. For Parliament realizes, and the nation is beginning to realize, that the state of foreign affairs, over which we have insufficient control at the moment, must determine, whether we like it or not, how much or how little we can do towards improving the conditions of our own people. And in the extreme, defeat in war and occupation by an enemy, even if it were only temporary, would abrogate all our schemes of betterment. The situation is certainly grim. General Ridgway, Commander-in-Chief of the United Nations Forces in the Far East, said in Tokyo in April: "We stand under the imminent threat of war"; and events since then have made the threat more intense. Let us make a rapid review of the danger points (all of which have been repeatedly mentioned in Parliament during the past few months) so as to form some idea of the total threat; and let us start with Korea.

The war in Korea has swung backwards and forwards several times since it began in May of last year. Originally a simple aggression by the North Koreans against the South, inspired doubtless by Russia, aided and abetted by China and opposed by the United Nations, it has now become a theatre in which United Nations forces are fighting those of Communist China in a limited area. The tide of battle ebbs and flows between the Manchurian border and the 38th Parallel, and while the United Nations' embargo upon carrying the attack beyond the Manchurian border remains, we can only hope to bring China into reasonable peace discussions by exterminating the seemingly countless numbers of her armies as often as she sends them into Korea. However desirable this embargo may be politically, it is clearly unsatisfactory from a military campaign point of view.

The unexpected prolongation of the war in Korea has rendered more urgent the need for the making of a peace treaty with Japan, to which Lord Vansittart recently drew attention in the House of Lords. There are, he said, no less than forty nations interested in this treaty. As the prospect of forty nations agreeing upon the terms of a common peace treaty would appear to be remote, particularly as Russia is one of them, Lord Vansittart suggested separate treaties. But it is to be noted that the signing of peace treaties with Japan and the removal of the occupation forces would involve the rearming of Japan for self-defence.

Now one thing leads to another, and the prospect of Japanese rearmament has led Australia and New Zealand to consider the possibility of another threat

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to their independence, so they have signed a joint pact with the United States of America, for their security. This pact has been criticized in Parliament because the United Kingdom was not asked to join in it. But the answer obviously is that the defence of Australia and New Zealand is necessarily a major concern of the Mother Country and needs no pact to make it more certain.

South-west of Japan lies the island of Formosa. Here is a powder magazine. It contains, besides the native inhabitants, General Chiang Kai-Shek and a considerable army of Chinese Nationalists who, though backed by the United States, were driven out of China by Mao Tse-tung's victorious armies. It was agreed at the Cairo Conference in 1943 between Great Britain, the United States and China that, after the war, Formosa should be restored to China, hence Chiang Kai-Shek's occupation. But the People's Republic of China claim it as their territory and would long ago have taken it but for the American Seventh Fleet that has orders to defend it against invasion. Apart from the facts that it is Chiang Kai-Shek's stronghold and that the U.S.A. is still backing him and his Chinese Nationalists, Formosa is strategically essential to American defence of the Western Pacific, as General MacArthur has pointed out. Meanwhile Chiang Kai-Shek and his nationalist forces are burning to take part in the war against the Chinese Communists, either in Korea or by invasion of the mainland of China, where they hope to find millions of supporters—which may well be true after considerable experience of Communism by the individualistic Chinese. The only thing that keeps the Chinese Nationalists from either of these two adventures is the present determination of the United Nations and of the United States to limit the war to Korea, a determination with which the British Government heartily agrees.

Coming next to Hong Kong, we find a large British garrison standing by to defend the Colony against attack from Communist China. Besides the garrison and the normal civilian residents, there are on the island and in Kowloon and the New Territories large numbers of Chinese refugees who do not wish to be communist. The defence of Hong Kong is difficult. Kowloon and the New Territories have a common frontier of about twenty miles with Communist China and the island is only a mile or so from the mainland. Yet Hong Kong must be defended. Its trade, mainly with China, is very important and, like Formosa, it has strategic value to the Western allies. Unfortunately its very trade has proved a cause of offence. The United States has put a complete embargo on trade with China and has asked Great Britain to do the same. His Majesty's Government have declined, because it has not so far been the policy of the United Nations to impose economic sanctions against China; but they have restricted the export to China, from the United Kingdom and her colonies, of all goods directly useful to China as munitions, or for the making of munitions, to the quantities normally required by China for peaceful purposes. Sir Hartley Shawcross gave an assurance to that effect in the House of Commons on 7th May. He said: "All goods of direct military importance and many other goods which might directly assist her (China's) military operations are totally prohibited." The other members of the Commonwealth have also been invited to conform, but they have not all agreed. Even with the American embargo and our restrictions, there are many other ways in which China can get munitions. Other nations may be willing to buy them from the United States or from the United Kingdom or elsewhere and to sell them to China, and it is impossible to prevent that. Also there is much smuggling which apparently cannot be controlled. Moreover, if Hong Kong's trade with China were seriously curtailed, not only would the people in the Colony starve, but Mao Tse-tung would

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probably attack it with the reasonable intention of reviving and maintaining its trade himself for his own benefit and that of his Republic.

And so we come to Indo-China, where France is waging single-handed a tedious and apparently endless war against the Viet-Minh rebels, backed as they are by Chinese Communists. As we write, France's Commander-in-Chief in Indo-China, General de Lattre de Tassigny, is in conference at Singapore with British and American Commanders-in-Chief to consider what joint action should be taken if the war in South-East Asia spreads. And that brings us to Malaya.

The jungle war drags on there in almost impossible circumstances against an enemy who appears suddenly and unexpectedly, burns a few houses, takes a few lives and then disappears again beyond pursuit. It is a nerve-racking war, but Sir Harold Briggs appears to have it well in hand, though the end is not yet in sight.

The three Asiatic "Dominions"—India, Pakistan and Ceylon—are loyal members of the British Commonwealth. They used to be regarded as the keystone of British territories around the Indian Ocean, and so they still are. With a strong British Army in India, ably assisted by the magnificent Indian Army, the landward frontiers of our Indian Empire were safe. Now things are different, and it is questionable whether India and Pakistan without our aid (which might even come too late) could defend their own territories from invasion from the north-east through Burma, from the north-west through Afghanistan or from the West through Persia and Baluchistan.

Persia itself is the scene of a very serious threat to world peace at the moment with the determination of the Iranian (Persian) Government to nationalise its oil industry and so to dispossess the Anglo-Iranian Oil Company of its enormously valuable plant and interests. Here again there can be little doubt that Russian influence is behind this suicidal policy. The Russians have, for more than a century, been interested in Persia. They need more oil themselves as their native resources are inadequate. There are enormous physical difficulties in getting Persian oil into Russia; but even if they do not get it themselves, they would be glad to deprive us of it. Then there would be the advantage to Russia of establishing herself on the Persian Gulf, which would give her a very much coveted warm-water port. Though we might make shift to do without Persian oil, since we have the Iraqi fields at present and the Americans have enormous resources in Saudi Arabia, yet we cannot allow Russia to establish herself on the Persian Gulf at Bandar Abbas, Bushire or Abadan. Such a move would be a direct threat to our security in the Indian Ocean.

Westward again we come to the Middle East, perhaps the most sensitive part of the world. Egypt is the key to the Middle East, and if Egypt is loyal and backed by a strong Power, the Middle East is safe. But Egypt is politically in an unhealthy state. Her government, which is the government of a rich oligarchy, whatever democratic façade may be erected to impress their own people and those of other nations, her government have made things very difficult for us. Not content with confining our forces to the Canal Zone, they are now trying to oust them altogether and are also denying us the right to bring oil tankers through the Suez Canal. Added to that, her army and air force have proved themselves no match for those of Israel, which bids fair to become a dominant nation in the Middle East.

For we are still in the habit of regarding Greece and Turkey as in the Near East. Both these States are important in the defence of the Middle East and Europe, and both are very anxious to play their part in the defence of democracy

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against communism, as members of some international organization like that of the North Atlantic Treaty. Both are being helped financially and economically by the United States, upon whose help, and the help of Britain, they could certainly count if threatened by Russia; but they naturally prefer to "have it in writing."

Contemplation of the Balkans leads us to Yugoslavia and Albania. The latter, we learn is almost a sub-state of Russia, being politically and economically dominated by the Cominform. Yugoslavia, though communist, has so far successfully resisted Russian domination. Marshal Tito has wisely persuaded the Western Powers to support him with credits and munitions and other supplies and he is prepared to defend his country against invasion or penetration inspired by the Kremlin. But he could not do so successfully without military assistance and it will be necessary, if Yugoslavia is attacked, for the Western Powers to go to her assistance, either directly or indirectly.

Nearer home, Western Germany, though still occupied, is steadily becoming self-supporting. Eastern Germany, we fear, must be written off as a total loss, unless the Western Powers are prepared some time to liberate her by force of arms. And a Russian-dominated Eastern Germany, with its so-called People's Police, is a menace to Western Germany, whither resort daily numerous refugees from the Eastern Zone. And this brings up the question of rearming Western Germany. Armed, she would be a welcome addition to the forces of Western Union, but the Germans themselves are not too keen. For that reason, Lord Vansittart has suggested we should play down the idea until the Assembly at Bonn shows more desire to contribute armed troops. The question is a difficult one. If we rearm Germany, what guarantee have we that she will not turn against us; and if we do not, and the Russians cross the Elbe and march westwards, they would surely arm the Western Germans as they have done those of the East and deploy them against us. On the whole, it would seem better and more logical to rearm Western Germany and guarantee them adequate help against an attack from the East, while taking what steps we can to prevent a resurgence of Nazism.

And here we are back again on the defence of Western Europe, which we have already discussed in these columns from time to time. But now the defence organization is taking shape, as we have seen at the beginning of this article. Yet there remains the task of forming and equipping enough divisions to check and hold an invader. Admittedly we are not yet ready for a full-scale war. Mr. Marshall has said the same of the United States. But he has also said that in a year or two the United States will be so strong that no other Power or Powers could hope to win a war against her. So if for the moment Russia and her satellites, with Communist China, are more powerful on land and perhaps in the air, they must attack this year or next, or else give up the idea of world domination altogether. The Western Powers will never start a world war except under extreme provocation, but extreme provocation might be given.

The choice of war or peace is Stalin's. As General Ridgway said again, "Nobody knows when the chips will be down. War can be unleashed at a time and place of the choosing of other people." That is only too true, but we shall be prepared.

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Training of a famous airman—Pilot-Officer L. G. Cheshire is signing up before taking off in the Hawker Hart, during Oxford University Air Squadron summer camp in 1937. *This officer eventually retired as a Group Captain and during World War II was decorated with the Victoria Cross for an act of outstanding valour.*

A combined Oxford and Cambridge University Air **Squadron Rugby Team** *emplaning for a tour of B.A.F.O.*

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THE UNIVERSITIES AND THE R.A.F.

By Wing Commander C. N. Foxley-Norris, D.S.O., R.A.F.

THERE may be a tendency, particularly among civilians, to suppose that the connection between an academic body, such as a university, and a military Service would, in the nature of things, be remote; their relationship may be expected to be confined to the granting of honorary degrees by the one party, and the keeping of a gentleman's agreement to avoid low flying over the university city by the other. It perhaps follows from this misapprehension that the officer-producing sources for the R.A.F. are roughly divided in most people's minds into Cranwell, for the permanent officer, and the short-Service schemes, for the temporary officer and, thereafter, the reservist. It may be of interest, therefore, to discuss the universities of today as training grounds for the R.A.F. officer, since, in fact, they produce a considerable and increasing proportion of both Regular officers and reservists.

THE UNIVERSITY ENTRANT SCHEME

There is in existence a well-established and clearly defined scheme by which young men, on graduating from their university, may obtain direct-entry permanent commissions in the R.A.F. The number of these commissions available is presumably limited, but, as the number of candidates in the post-war period has never approached this limit, it has little practical application.

The majority of undergraduates who decide to make the R.A.F. a permanent career are already members of a university air squadron, of which more later, but this is not a necessary prerequisite for consideration. At present university air squadrons train pilots only, though fighter control units are in process of formation, so, naturally, potential members of other aircrew branches and technicians do not pass through the squadrons. The process of application for a permanent commission is, however, the same in every case. The candidate is first interviewed by the C.O. of the squadron, to assess his general suitability and to make sure that his application is serious and well considered. The C.O.'s report, together with those of the university educational and disciplinary authorities, comes before the Military Delegacy, a board of senior university members with military experience and backgrounds, which proceeds to interview and judge the candidate; and, finally, the Delegacy's recommendation is forwarded to Air Ministry, where it appears to be accepted in nearly every case.

Once over these hurdles, the undergraduate is told of his selection for a permanent commission, subject to medical fitness and to successful graduation from the university. The extent of this success determines what seniority is granted with the permanent commission; a first- or second-class honours degree carries seniority of twenty-one months in date of commission, third- or fourth-class, fifteen months; any previous commissioned service will, of course, also be counted in part towards seniority.

The natural comment on this scheme that springs to the mind is how easy is the way and wide the gate for the university entrant, as compared to that of his brethren of Cranwell, and how superficial appears to be the assessment and

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judgment of his qualities as a permanent officer as opposed to that available during a Cranwell course. It may also be argued that it is unfair for a young man to have to undergo the prolonged rigours and inquisitions of the cadet college, while his twin brother treads the primrose path for three years at Oxford or Cambridge, and eventually slides gracefully into the R.A.F. list only a few places below him.

In most cases during the past five years the charge of insufficient investigation of an undergraduate's officer qualities could be met by the statement that he had already, in fact, served as a war-time officer. The majority of undergraduates in the immediate post-war period had seen commissioned service, and, if they applied to rejoin as permanent officers, ample evidence of their qualifications was available in their Service records and reports. This was clearly a temporary phase, but even now most undergraduates have completed National Service, often as officers, and a valuable guide to their potentialities is thus available. In many instances, however, the candidate for a permanent commission has come straight from school to the university and it is undoubtedly true that the assessment of these future officers as described above cannot, in the nature of things, be as thorough as that possible at Cranwell.

The only answer must lie in past experience. The proof of the pudding is in the eating, and one must assume that, had the system of direct university entry not produced officers well up to normal standard and not shown dividends in the Service in the past, it would long since have been dropped or drastically amended by the Air Ministry. The fact of its survival, and post-war revival in practically unaltered form, is sufficient advertisement and recommendation for the system as it stands.

THE UNIVERSITY AIR SQUADRONS

The majority of these recruits from the university for the R.A.F. have served in university air squadrons, of which there now exist seventeen in Great Britain. The first two to be formed were, perhaps not surprisingly, at Oxford and Cambridge, and both came into being in 1925. The same Air Ministry paper acted as midwife for the two, but, as with all but the most exceptional twins, one had to come first, and Cambridge has some claims to priority by the fact that it was the first squadron to receive the posting-in of regular staff. Oxford and Cambridge were joined before the war by London, and since then eleven more squadrons have reached full development, and three others are forming. The "Big Three" have an establishment of a hundred flying members each, and the smaller universities sixty. Most of the squadrons are full or nearly full, so in all, at any one time, the university air squadrons are training about a thousand pilots.

This is a figure by no means to be sneezed at, but, naturally, the obvious question, and a vital one, arises: "Well and good; we are training a lot of young men at the universities to fly; what good are the country and the R.A.F. getting out of the scheme in the long run?"

To hark back again, "the provision of an avenue of entry into regular permanent commissioned service" was originally one of the two main objects of the foundation of the squadrons; the other was tactfully expressed as "to introduce the idea of the air and of the Royal Air Force to the minds of both the senior and junior faculties of the universities." In other words, the original conception of the squadrons aimed at spreading the gospel of the air generally in the universities, with the hope that some of the seed would fall on such fertile ground that a harvest of permanent officers could be reaped, as well as one of good will and air-mindedness. Since 1936 there has been a third objective officially expressed,

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perhaps of less intrinsic value but none the less desirable: the production of partially trained reserve and auxiliary pilots for use in emergency.

Let us see to what extent these aims are being attained. To take the last first, all undergraduates now undertake a Volunteer Reserve commitment on being accepted into a university air squadron, and, though a recent regulation restricts this commitment to a minimum requirement of the length of their stay at the university, the majority voluntarily prolong this service. This provides an undoubtedly valuable backbone of recruits for the Volunteer Reserve, particularly as the vast majority of its present members are ex-pilots "soldiering on," and the university air squadrons, together with the National Service pilot-training scheme, are the only units feeding new blood into this reserve. The value of its training is, however, reduced by the type of aircraft flown; at present these consist only of the same elementary types provided for the university air squadrons, so training ceases to be progressive after a certain stage. The Air Ministry is aware of this difficulty and is seeing what can be done to improve R.A.F.V.R. training. At present, however, although a reserve of pilots is being produced, they are by no means first-line reservists, and would need a further extended period of training before undertaking combat duties.

The mention of first-line reservists brings us to the Royal Auxiliary Air Force, which would appear to be the obvious goal for the recent graduate of a university air squadron going into civilian life. Indeed, before the last war, this was so, but that was in the days when the university and auxiliary squadrons were equipped with the same or similar aircraft, e.g., Audax and Demon, and the transition from one to the other was easy, involving a minimum of preliminary training before qualification as a fully fledged auxiliary pilot. Since the war, however, the re-equipment of the auxiliary squadrons with modern jet fighters, and the need to bring them up to a state of front-line efficiency to support the regular force of Fighter Command, has set a new problem. The gap between the standards of skill and knowledge reached in the university squadrons on elementary aircraft and that required by the auxiliary squadrons has tended to widen, particularly in the field of ground training, where the need for the modern pilot to acquire more thorough and abstruse knowledge conflicts directly with the requirements of the intensive academic schedule faced by the modern undergraduate. Immediately after the war this difficulty was to some extent overcome by the fact that the undergraduate in question was very often an ex-operational fighter pilot, but, as we have seen above, he is now being replaced by a younger type. As an *ab initio* trainee the latter cannot at present in most cases find his way over the gap from the university squadron to the Royal Auxiliary Air Force, and each institution is the loser by this fact.

When we turn to the final and most important aspect of the question of the usefulness of the university squadrons, the supply of candidates for permanent commissions, the picture cannot be said to be bright, but at least it is brightening. Before the war there was a steady flow of officers from the universities to the Royal Air Force, though it was naturally limited by the small size and requirements of the latter at the time. In the immediate post-war years, this flow became a mere trickle, for reasons that were not far to seek. The great majority of undergraduates at that time had served in the forces during the war, with three possible resultant effects on their outlook; either they had been given a chance of a peace-time permanent commission and had, on consideration, refused, in which case they were not likely to change their minds so soon; or they had wanted such a commission, been refused, and as a result were somewhat sour about the whole

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matter; or, finally, they had been neither suited to or by Service life, and so were generally ineligible. Add to this the "sellers' market" in employment at the time, by which any averagely personable and intelligent university graduate could be sure of an attractive and lucrative civilian job, and it is not difficult to see why candidates for permanent commissions were so few.

It was to be hoped and expected that this state of affairs would be very temporary, but up to a point it was extended and even intensified by the National Service scheme. The majority of undergraduates had completed their National Service before coming to a university, and it may as well be admitted that they did not see Service life at its most attractive therein; particularly was this true in the Royal Air Force, where for some time ground service only was available, usually without a commission, to the National Service man. Of late, however, things have begun to improve. Recent official figures still give the intake of permanent R.A.F. officers from the universities as about fifty a year, of which more than half come from Oxford and Cambridge. These numbers, however, are progressively increasing, and at the present rate will show an improvement of at least 50 per cent. by 1952. There are several reasons for this welcome advance, among the most obvious being the deterioration of the international situation, whereby the prospects of stagnation and absence of promotion, inevitable in the Services during long periods of undisturbed peace, are lessened; the improved material terms of service introduced during 1950; the tightening of the labour market as it affects an undergraduate; and, most important of all, a general casting-off of apathy and an awakening to the needs of the country and the Services, exemplified by the huge expansion programmes recently undertaken.

THE FUTURE

Present relations between the universities and the R.A.F. are based on sound and well-tried foundations in the past, and are at this time extremely cordial; for the future we need look no farther than Lord Tedder's recent appointment as Chancellor of Cambridge to see how they can become closer and more significant every day. The R.A.F. should be awake to the advantages of this situation; the reserves of experience and knowledge, technical and otherwise, of potential leadership, and of man power in the universities have in the past been largely untapped by the Services. The universities today, by their past traditions and present policies, are in a position to paraphrase Keith Prowse and say: "You want the best men; we have them." The R.A.F. must show by its actions that it does not intend to miss this opportunity.

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THE MANUS NAVAL BASE

By Flying Officer G. Bentley, R.N.Z.A.F.

TO the many thousands of Allied Service men who during the Pacific War served in the Admiralties Islands, the news that the mighty and costly naval base at Manus, the subject of fierce post-war controversy, is fast becoming a rusting jungle scrap-heap will be received with interest, disappointment, and shock.

Although few, if any, New Zealand Service men saw the building of Manus into one of the most powerful naval bases in the world—an undertaking, incidentally, which is reported to have cost the United States £50,000,000—they arrived in time to appreciate the enormity of the military transformation and to see operate from there the fleets of three nations together with Allied air forces —for the Admiralties had their airfields, too.

The fact that New Zealanders saw service on Manus—or, more correctly, Los Negros, the tiny island separated from Manus by a narrow channel, over which the Americans threw a traffic bridge, making the islands one—is not generally known. Except for a few Kiwis serving there with units of the British Pacific Fleet the New Zealanders in that area were personnel of the Royal New Zealand Air Force. And, because, its aircraft were not in daily air combat with the enemy, the work of the Royal New Zealand Air Force at Manus did not come into the limelight in those years.

One of the Royal New Zealand Air Force's assignments in that area was to harass and keep under control the 100,000 by-passed Japanese on New Britain and New Ireland. Its other principal task was to provide fighter cover for the huge and important military installations that were on Manus.

Few pre-war maps showed the little-known island of Manus. Some war-time maps contained a few tiny dots in the Bismarck Sea, about midway between Dutch New Guinea and the north-west tip of New Ireland. These are the Admiralties. Roughly 3,000 miles north-west of New Zealand and 200 miles below the Equator, the principal islands of this group, Manus and Los Negros, command the approaches to New Guinea and Australia. There are some 200 other islands in the Admiralty Group, none of any real importance.

Manus itself is forty-nine miles long and sixteen miles across at its widest point. Its terrain differs little from any of the other multitudinous groups of isles, rocks and atolls which stud the broad waters of the Pacific. Manus is mountainous in places and swamp-filled in others. It is overgrown with sweating jungles, infested in the interior with malaria-carrying mosquitoes. In the interior, too, cholera, dysentery, typhus, elephantiasis and yaws are rampant. Disease was the main obstacle during the early period of American occupation, but malaria was well controlled by the Services, and as the portion of Manus occupied by the Allies was only a comparatively small section by the sea—and as there was no need to venture into the hinterland—disease was not so great a menace in 1944 and 1945.

Los Negros, where the New Zealanders were based, is less heavily forested. Jungle has given way to neat coconut plantations in many areas. Being only a narrow strip of land, sea breezes assist in keeping the temperatures more moderate. The two islands have been likened to a large whale blubbering across the Bismarck Sea towards New Guinea. Los Negros, the tail of the whale, six

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This bridge, built by the American forces, joins the two islands—Manus and Los Negros

miles long and of varying but negligible width, was, of course, an island itself, separated from Manus by narrow Loniu Passage. The erection of the traffic bridge in 1944 made Manus and Los Negros one mainland and enabled one to drive from the New Zealand camp at Mokerang airfield around the coast to the huge arsenal at Manus.

All this spelt progress. But the portion of the country that was inhabited and habitable was very small; the hinterland was dangerous to health and of no use to man. What, then, made Manus so valuable to the Allies, so equally vital a base as Guam, worth the spending of millions? The answer lay in its harbour. This lagoon, known variously as Seeadler Harbour and Manus Harbour, is a stretch of water enclosed by reef-bound islands to the east and northward, forming a protected anchorage more than fifty miles long and from two to seven miles wide. Encircled by the Manus mainland and the crescent-shaped Los Negros, it was large enough to accommodate all the navies of the Allies. And in the years of which I write, it was the busiest and most vital sea base in the whole of the South Pacific. Its waters held every conceivable type of craft, from barges to battleships.

Standing on the edge of the New Zealand camp one night in 1944 and looking across the harbour towards the larger Manus coast, it was easy to imagine you were looking at Wellington or Auckland. On this occasion there were over 100 vessels in the harbour; the water was literally studded with shipping as far as the eye could see. By day or by night, the most prominent objects in the harbour were the massive floating docks. The story of their remarkable journey from the United States is itself a maritime epic. The larger dock was 827 feet in length (which is twice the length of an average overseas freighter) and 256 feet in width. It was towed in ten sections from the United States, each section on its own pontoon and complete with machinery and crew. Each pontoon had its own

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complement of sixty-five men, a galley, refrigeration and evaporation plant, and an engine-room. Six pontoons made the long ocean crossing in the first convoy. To avoid enemy interception a course was set for Samoa. The convoy arrived off Pago Pago and passed north of the New Hebrides and through the strait between New Guinea and New Britain. On 22nd June, 1944, it moved quietly into Manus Harbour, having completed a voyage of more than 7,000 miles in fifty-one days at an average speed of six knots.

The assembling of the dock was begun before the other pontoons arrived, and the dock was itself commissioned as a ship of the United States Seventh Fleet. In fixing it to a permanent site, thirty-two anchors each weighing fifteen tons were used. Nor did it ever move an inch from its position, the Americans claimed. You could walk all around it and feel no movement from the sea.

The United States ship *Canberra* was in dry dock during my first visit. A lift, complete with attendant, shot one up to the top from the landing stage, an amenity of modern civilization quite out of keeping with this remote Pacific island. Then one saw that the docks were marvels of mechanical engineering. It was possible to wander through their countless compartments and get lost quite literally in the maze.

The *Canberra*—named by the Americans after the Australian warship sunk off Guadalcanal in the dark days of 1942—was fresh from the war theatre. A large hole yawned in her side; it must have been over fifty feet wide, and two omnibuses side by side could easily have passed through the gap. Later, an American officer explained that the *Canberra* had been torpedoed off Formosa two months before and had been brought in tow to Manus for repair.

In April of 1945 those who manned the docks and lived ashore were forcibly reminded that the Japanese were still about, even though the scene of war had shifted to the Philippines. Two Jap aircraft made a surprise attack from a base (presumably) at Rabaul. Hits were scored on the docks with a bomb and an aerial torpedo. There were no casualties. Work went on for twenty-four hours a day servicing ships of war.

The transition of Manus from a jungle-matted wasteland to a powerful naval station within five months of its being wrested from the Japanese was striking evidence of the speed and ingenuity of the United States Navy. The United States First Cavalry Division in February, 1944, seized the territory after a brief but bitter campaign. The Seabees, landing on the heels of the invaders, got to work on the red, shell-torn beach backed by dense jungle and in a few months turned it into a miniature industrial city—for that was how it appeared to me later that same year.

The Japanese seized the Admiralties four months after Pearl Harbour, taking possession from the few Australian officials who normally administered 15,000 Melanesians under a League of Nations mandate. (Before the First World War the islands were a German protectorate.) Having taken the Admiralties, the Japs did little to develop Manus as a fleet anchorage. (They had a wealth of naval prizes, anyway.) It remained a lightly held base, a stepping-stone and a rearguard for the greater citadel at Rabaul. So, when the Americans came, they found relatively few buildings. But by the end of September, almost 3,500 Quonset huts had been flung in rows across the hillsides, like giant criss-cross cartridge belts, and no fewer than 960 supply warehouses crowded the narrow waterfront.

The building of the Manus base was another Seabee triumph, made possible by Commodore James E. Boak—who built the Espiritu Santo base—and his men. The versatile Seabees carried with them everything they needed, from aerial

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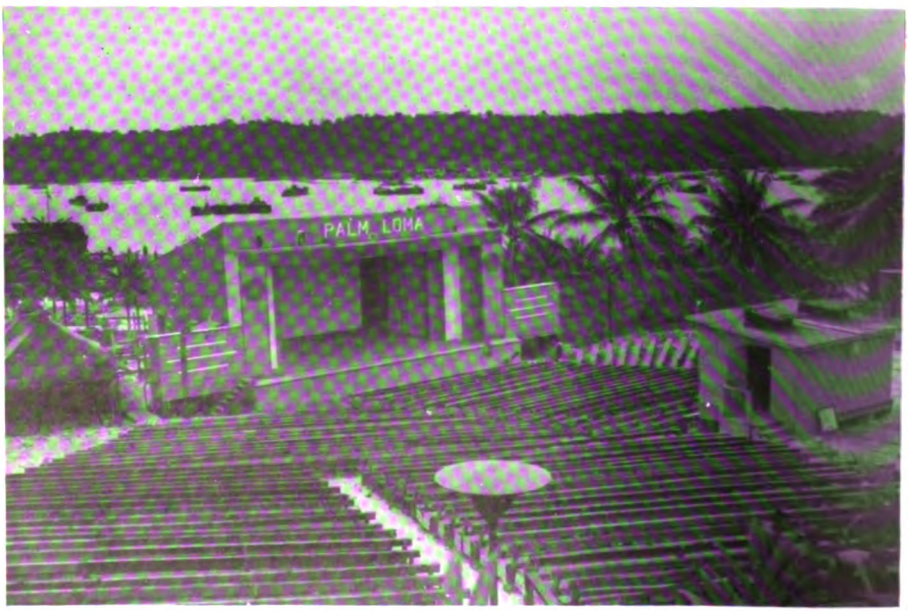
photographs and bulldozers to 15,000,000 dollars in currency (for the pay-roll) and 50,000 cases of beer.

They began their task in May, 1944. Literally miles of swamp were buried under tons of coral, blasted from the harbour ledges, upon which were erected the shore installations. Bulldozers hacked a path through the jungle; palms, pandanus, mangrove and mahogany toppling under their relentless onslaught, and miles of smooth coral highways appeared as if by magic. The Seabees worked at pressure. Huge machine shops sprang up—large repair depots, a giant mess hall, a radio station, a fleet post office, warehouses, clothing stores. A large chlorination plant was built to purify the water; a reservoir was created to store it. Hospitals and dispensaries, administration centres, malarial control centres, a transit personnel depot, all followed. The tall ubiquitous palms became telephone and electric power poles.

Heat and tropical diseases exacted a heavy toll. Torrential rains turned roads into bogs. But in five months the Americans had built a base to supply, repair and maintain a naval fleet on the southern flank of the Japanese Empire, a vital base for the impending Philippines campaign, and a challenge to Tokio.

So much for the naval base. But Manus was more than a naval base. In 1944 and 1945 it was a busy centre for a great web of airlines extending to New Zealand, Australia and New Guinea in the south, and to Manila, Pearl Harbour and the United States in the north.

Day after day, giant four-engined transports—Liberators and Skymasters—flew in from distant bases and took off again for new destinations in the Pacific. Often they trundled down the smooth coral runways at dead of night, huge searchlights guiding their take-off. Twin-engined Dakotas, Lodestars, and Hudsons of the Royal New Zealand Air Force transport squadrons touched down on the Los Negros strips, bringing mail, freight and replacement personnel. Transport aircraft of the Royal Australian Air Force plied to and from the Com-



Open air theatre (U.S. built) on Manus. Edge of the ***Harbour in background***

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monwealth or New Guinea, and Douglas Dakotas and Curtis Commandos of the United States Marine, Navy and Army Transport Commands flew daily schedules. The island's two large airfields, Momote and Mokerang, were always scenes of constant activity.

Largest and busiest of the Admiralties' airports was Jap-built Momote, where the Japanese lost 3,000 in dead and wounded in a futile, all-night attempt to retake the airfield.

At Mokerang field (8,000 feet long) the Royal New Zealand Air Force operated Corsair squadrons whose main role was one of fighter protection.

Between these airfields on Los Negros and the naval base at Manus itself was spread a network of highways that took a heavy pounding from trucks, quads., command cars, jeeps, peeps and their mechanical in-laws. Telephone communication, too, linked both the mainlands and at least one other small neighbouring island—I think it was Pityilu, north of Manus, where Admiral Sir Bruce Fraser's Pacific Fleet maintained a busy naval air station.

All this modern change was wrought almost overnight in a territory which had retained its primitive changeless state through the centuries. And the warships, fighting planes, jeeps, telephones, cinemas and refrigerators had all appeared from another world before the wondering eyes of the natives. What they thought of these embellishments of modern civilization and terrifying machines of war was locked up impenetrably under their heavily thatched skulls and behind their imperturbable eyes.

Today, however, the primitive state they knew is returning. Today the jungle is reclaiming the great smooth runways and (we are told) the millions of dollars-worth of trucks, planes, cranes and machinery are just so much rusting scrap. I recall that it was predicted that this state might follow in the years after the war, and one American replied: "It will be cheaper to produce this all again than transport it back to the States." Whether or not that was so, I do not know. But it is patently wrong that so important a military base, strategically of much significance to Australia and New Zealand, should fall into complete deterioration in another period of international disquiet because of political bickering. It is lamentable that the United States, at first willing and able to maintain Manus as one of a chain of South Pacific bases, should have been (to use the *Sydney Morning Herald's* words) "frozen out" by earlier Australian policy.

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MEMBERS OF THE BOARD OF ADMIRALTY TAKEN DECEMBER, 1950

Left to right: Leonard James Callaghan, Esq., M.P., Parliamentary and Financial Secretary; Walter James Edwards, Esq., M.P., Civil Lord; Rear-Admiral R. A. B. Edwards, C.B., C.B.E., Assistant Chief of Naval Staff; Vice-Admiral Sir George E. Creasy, K.C.B., C.B.E., D.S.O., M.V.O., Vice-Chief of Naval Staff, Admiral of the Fleet; Lord Fraser of North Cape, G.C.B., K.B.E.; First Sea Lord and Chief of Naval Staff; C. G. Jarrett, Esq., C.B., C.B.E., Deputy Secretary; Viscount Hall of Cynon Valley, P.C., First Lord of the Admiralty; Sir John G. Lang, K.C.B., Permanent Secretary; Vice-Admiral A. C. G. Madden, C.B., C.B.E., Second Sea Lord and Chief of Naval Personnel; Vice-Admiral Sir Michael M. Denny, K.C.B., C.B.E., D.S.O., Third Sea Lord and Controller; Vice-Admiral The Earl Mountbatten of Burma, K.G., P.C., G.C.S.I., G.C.I.E., G.C.V.O., K.C.B., D.S.O., LL.D., D.C.L., D.Sc., Fourth Sea Lord and Chief of Supplies and Transport; Vice-Admiral M. J. Mansergh, C.B., C.B.E., Fifth Sea Lord and Deputy Chief of Naval Staff (Air).

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DEVELOPMENT IN NAVAL AVIATION

By Rear-Admiral H. E. Horan, C.B., D.S.C.

FOREWORD

PARLIAMENT has decided on a policy of rearmament and has voted the money with which to carry it out. Perhaps it would be as well to take stock of what the Admiralty is doing with regard to the strengthening of Naval Aviation.

With the great increase in the range and power of aircraft the threat to our sea communications, not only from enemy submarines, but also from their air forces, is a matter of first-rate importance in planning the strategy of any future war. As ever, the object of the Royal Navy is "to locate and report, attack and destroy" anything that menaces our ships on the high seas.

In the last war the use of aircraft in the role of commerce protection proved their worth. Owing to the lack of prevision and provision prior to 1939, many makeshift devices had to be employed to enable the full weight of air power to be brought to bear on the German submarines and aircraft which attacked our shipping.

With the lessons fresh in their minds, the Admiralty, since the end of the war, have carefully and methodically been carrying out research and experiment with the object of having the personnel and material of Naval Aviation ready at an instant's notice to swing into action with everything so that this branch of the Service may carry out its role in the protection of the sea communications of the Empire and those of our allies.

AIRCRAFT CARRIERS

First and foremost in the problem of the efficient employment of Naval Aviation, in whatever role it may be called upon to play, is the provision of aircraft carriers. This is on all fours with the policy of the Royal Air Force after the First World War, when it was decided to concentrate on the provision of bases from which their aircraft could work and in which the personnel could live and have their being.

At present the Royal Navy has six fleet carriers of from 30,000 to 32,000 tons displacement, each capable of operating and maintaining sixty aircraft. These ships are in the process of being brought up to date and having every device proved necessary to increase their efficiency embodied in their design.

In addition to the above there are six light fleet carriers in existence. These are smaller ships of about 18,000 tons displacement and designed to operate about forty aircraft. (The main difference between the classes is that the former have considerable armour protection.) This class of ship, which includes the *Theseus* and *Triumph*, of Korean fame, are also being modernized. It can be safely assumed that these ships in any future war will be employed with the convoys which sail through the danger areas.

During the last war the need for a special type of carrier made itself felt. The role of these ships was for maintenance and ferrying the aircraft employed in the various areas of operations. Of this type there are three with the Fleet at the moment. Two, *Perseus* and *Unicorn*, can carry out the repair and maintenance of aircraft, while the *Campania* is designed for ferry duties.

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H.M.S. "THESEUS"

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The Dominions of Canada and Australia have also taken over two of the light fleet carriers (*Magnificent* and *Sydney*), and, of course, these must be added to the total of our available forces.

NEW CONSTRUCTION

In addition to the above there are two large fleet carriers nearing completion, *Eagle* and *Ark Royal*, which are of 45,000 tons and capable of operating 100 aircraft. They were laid down since the war and, of course, embody all new fittings and items of design.

Other new ships which are due to be completed before these are four improved light carriers whose displacement is about 23,000 tons.

It is seen, therefore, that by 1954 the carrier fleet will consist of twenty-three ships all of the most modern type and built for the job. This is a great advance on the six carriers with which we started the war in 1939, four of which were "conversions."

NEW AIRCRAFT

Owing to the limits imposed on the design of aircraft for Naval Aviation by the question of space, weight and performance which rule in the carriers, the designers were set some very difficult problems. These have in all cases been overcome, and it is only right to say that the aircraft in use in the Royal Navy will in a short time be second to none.

In addition to the aircraft required for miscellaneous duties there emerge three distinct types, viz., fighter, strike and anti-submarine.

FIGHTERS

The main role of the naval fighter aircraft is, of course, the protection of the ships at sea from attacks by enemy aircraft. The types developed, all of which are either in service or about to be delivered, are as follows:

Attacker, Mark I (*Supermarine*). — Span, 36 ft. 11in.; speed, 520 knots; armament, 4 x 20-mm., plus 2 x 1,000-lb. bombs.

Sea Hawk, Mark I (*Hawker*).—Span, 39 ft.; speed not yet released; armament, 4 x 20 mm.

Venom (*de Havilland*).—Two-seater night fighter. Details still secret.

All the above have jet propulsion.

Sea Fury, Mark II (*Hawker*).—Span, 38 ft. 5 in.; speed, 400 knots; armament, 4 x 20 mm., plus 2 x 1,000-lb. bombs or 12 x 60-lb. rockets.

Sea Hornet, Mark XXI (*de Havilland*).—Span, 45 ft.; speed, 400 knots; armament, 4 x 20 mm., plus 2 x 1,000-lb. bombs or 12 x 60-lb. rockets.

These two types have piston engines.

STRIKE AIRCRAFT

The aircraft used for strikes with torpedoes are naturally improvements on the Fairey Swordfish and Blackburn Shark which did such good service during the last war. But in this case the advent of jet propulsion has produced a startling advance. This is the Wyvern (Westland). With a wing span of 44 ft. and driven by an Armstrong Siddeley Python Turboprop it carries a torpedo plus 16 x 60-lb. rockets. Other details of this aircraft are still on the secret list, but it will be remembered that, with a full load, it carried out fighter aerobatics at the S.B.A.C. Display last year.

ANTI-SUBMARINE AIRCRAFT

An anti-submarine aircraft may be said to embody the object of all naval craft

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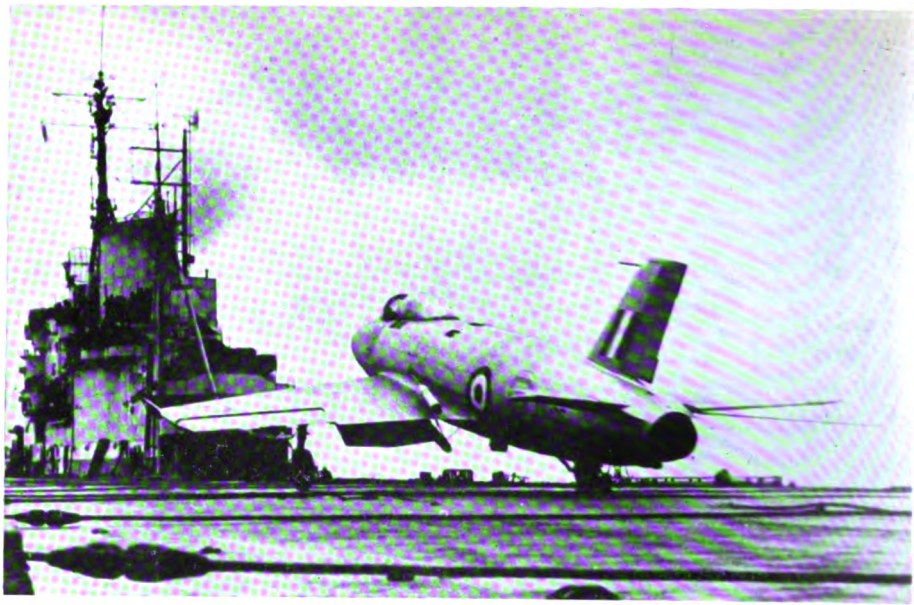
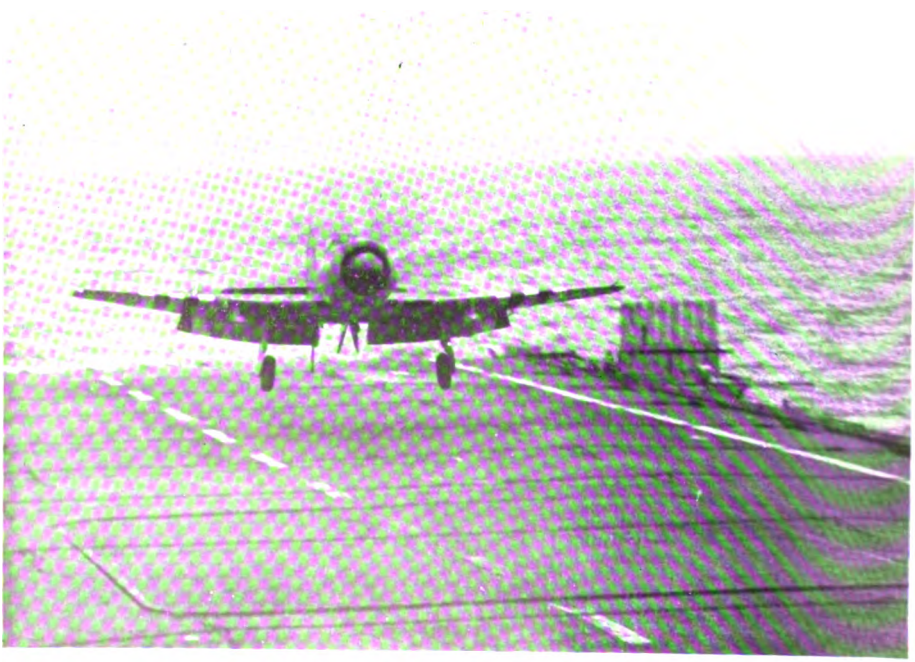


VICKERS SUPERMARINE TRIALS IN H.M.S. "ILLUSTRIOUS"
The first land-on by a Lieutenant of the Royal Navy from the Royal Aeronautical Establishment, Farnborough



A Sea Fury aircraft landing on H.M.S. "Theseus" (light fleet carrier) following a sortie against the enemy in Korea

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—"to locate and report, attack and destroy" the under-sea menace to our ships at sea.

Great thought and experiment were given to the new type to be used by Naval Aviation. As a result, the Fairey "17" has come into being. This aircraft carries the very latest equipment for locating and attacking the submarine. This includes a radar installation which is fitted in a retractable "radome" mounted in the fuselage abaft the cockpit. In addition, it carries, in a large bomb bay, the very latest anti-submarine weapons, many of which are still secret. The power is provided by a double Mamba Turboprop which is built into the fuselage in such a way that the exhaust gases are discharged well to the rear of the wings and cockpit. The use of this method of propulsion ensures that the delicate instruments suffer very little from vibration and the crew of three can carry out their duties in comfort.

Until the Fairey "17" comes forward, Naval Aviation will retain the well-tried Fairey "Firefly" (Mark VI, two-seater, and Mark VII, three-seater) for anti-submarine duties.

MISCELLANEOUS TYPES

In addition, to the types of aircraft described already, it falls to the lot of Naval Aviation to carry out certain duties not usually associated with the Royal Air Force. One of these is air/sea rescue. Here the helicopter has proved its worth. Not only has this type of aircraft been used effectively in that role in the recent operations in Korea, but it has also effected rescues of personnel who have come down behind the enemy lines.

Also, Naval Aviation has a type of amphibian, the Supermarine Sea Otter (which has replaced the Walrus) and the Seagull still in its experimental stage.

MATERIAL—RESERVES AND MAINTENANCE

So far we have only been considering the actual types of ships and aircraft, but before leaving them it is only right to examine how the reserves and the maintenance of and repairs to aircraft are being looked after.

There is a Reserve Aircraft Command under a Rear-Admiral (E), who controls the aircraft maintenance yards. The largest of these is situated at Fleetlands, near Gosport, and here, with a civilian staff of 1,400, the normal through-put per annum is as follows: complete overhaul of 150 aircraft, 360 engines and 240 power plants.

In addition to this, Rear-Admiral Reserve Aircraft keeps a number of aircraft at forty-eight hours' notice with which he can replace casualties with a minimum waste of time. All types in reserve are periodically brought forward and tested to ensure they are ready and fit to fly.

PERSONNEL

For the conclusion of this article the most important part of Naval Aviation, namely, the personnel, will be dealt with.

The officers and men employed in Naval Aviation now number almost one-third of those in the Royal Navy. It is only right to say that the training of this number presents a large and complicated problem, particularly when the intricacies of modern aircraft are considered.

This training is divided into two parts—Ground Training and Flying Training, each branch being commanded by a Flag Officer. In overall charge there is the Flag Officer Air (Home), who also has the Rear-Admiral Reserve Aircraft in his command. It follows, therefore, that F.O.A. (H.) is directly responsible for the provision of both the personnel and material for the fleet at sea.

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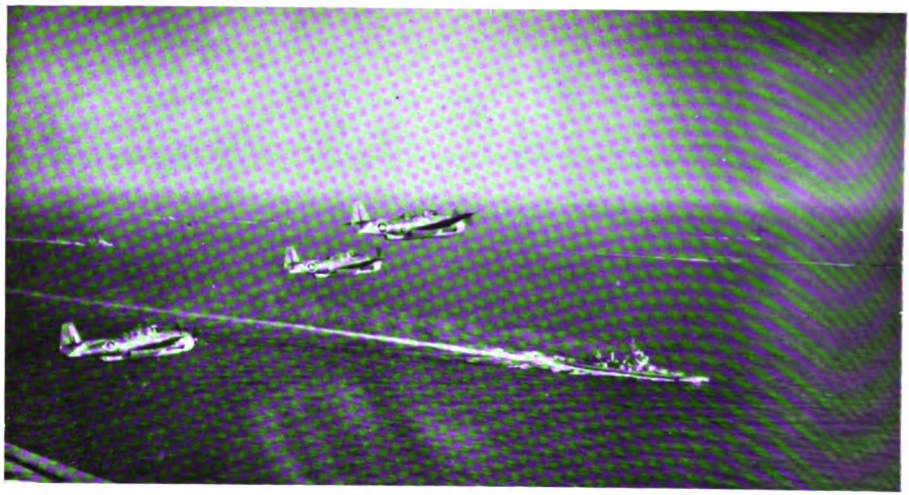

BRITISH PACIFIC FLEET CARRIER IN STRIKE AGAINST THE JAPANESE

Naval Avengers flying over the battleship "King George V" and other units of the British Pacific Fleet when on their way to attack Sakishima targets

A midshipman being "rescued" from an inflated dingy by a **Dragonfly helicopter, during** *an air-sea rescue exercise*

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The Headquarters of F.O.A. (H.) is at Lee-on-the-Solent (H.M.S. *Dædalus*), where the depot for Naval Aviation personnel in also located. This establishment carries out the duties of a home port in so far as the officers and men employed in naval air work are concerned.

Flag Officer, Ground Training, also flies his flag here, and here it is that any man who chooses to make a career in Naval Aviation makes his appearance. Depending on what branch of the Service he volunteers for he is then sent to the appropriate establishment to undergo his training after completing his new entry training at Bramcote (H.M.S. *Gamecock*).

Specialization is the order of the day in Naval Aviation. It is only in this way that maximum efficiency can be obtained in a short time.

The standards for all officers and ratings, both physically and mentally, are of the highest order, and the keenness and efficiency of all are most marked.

Flag Officer, Flying Training, has his Headquarters at Donibristle (H.M.S. *Merlin*), and here the would-be pilot or observer gets his initial training. The pilot then goes to the R.A.F. Station at Syerston—where he is trained to "wings" standard. His next step is the R.N. Operational Flying School (H.M.S. *Fulmar*), at Lossiemouth, where he is "converted" to naval types of aircraft. From there he goes on to the Operational Flying School, Part II, which is conducted at Culdrose (H.M.S. *Sea Hawk*) for fighter and strike pilots, and at Eglinton (H.M.S. *Gannet*) for anti-submarine pilots. In these establishments all pilots receive their weapon and tactical training. The last fortnight of this course is spent in the training carrier learning the technique of deck landing.

On completion of pre-flight training, observers go to St. Mervyn (H.M.S. *Vulture*) for navigation, radio and reconnaissance training, and thence to Eglinton for anti-submarine training, where they team up with the pilots undergoing Operation Flying School, Part II.

Other training establishments are situated at Warrington (H.M.S. *Ariel*), electrical; Arbroath (H.M.S. *Condor*), mechanicians; Yeovilton (H.M.S. *Heron*), pilots' mates; Gosport (H.M.S. *Siskin*), aircraft handling, safety equipment and survival courses. Here, also, is situated the Royal Naval Air Medical School, which maintains a close liaison with the School of Aircraft Medicine, Farnborough.

At Yeovilton are the School of Aircraft Maintenance and the Air Ordnance School. The latter is to Naval Aviation what Whale Island is to the rest of the Fleet—the home of gunnery.

A particularly important job in carrier work is that of the Deck Landing Control Officer. These are chosen from specially selected pilots and qualify as D.L.C.O. after a very searching course which is also carried out at Yeovilton and in the Training Carrier.

CONCLUSION

Enough has been said to show that the Admiralty have got the matter of Naval Aviation well in their minds. It only remains to point out that the Fifth Sea Lord is Deputy Chief of the Naval Staff (Air) and not only is responsible for the Departments dealing with Naval Aviation in the Admiralty but also controls the work of the Vice-Controller (Air). The latter deals with naval aircraft development and production, equipment, maintenance and repair.

It is only right to assume that all is well with Naval Aviation and that if called upon it will be ready to discharge its duties efficiently in the control of our sea communications.

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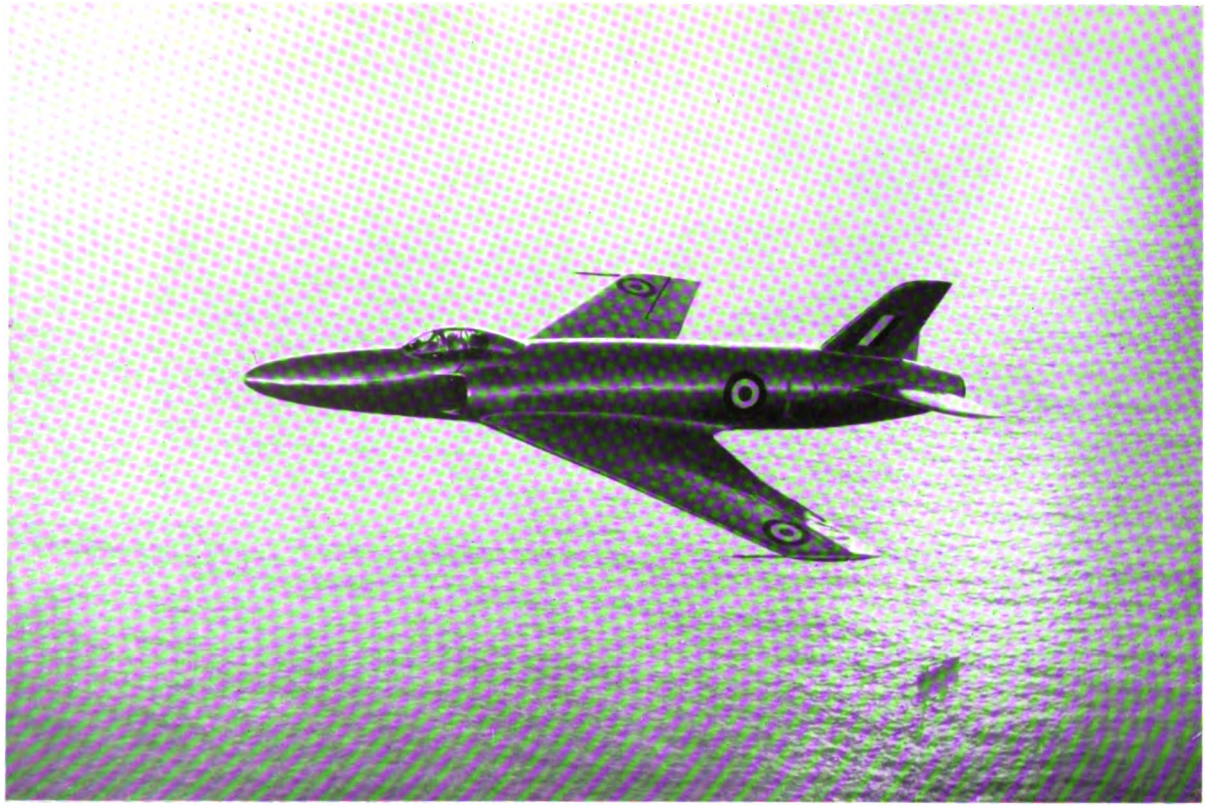

THE VICKERS SUPERMARINE 535

Typical of latest generation of jet fighter aircraft ; but designs like this cannot be expected in Squadrons much before 1954

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RE-EQUIPPING THE ROYAL AIR FORCE

A Survey of Present Trends

BY "ROUNDEL"

NO student of air power, studying the equipment of the Royal Air Force in recent years, could fail to be aware of its defects in many important fields. The provision of jet fighters for home-based defence squadrons was, admittedly, fairly rapid from 1946 onwards, but the position has been much less satisfactory in auxiliary squadrons and in overseas fighter squadrons. It is only recently that the Far East Air Force laid aside its Spitfires and Tempests on the arrival of Vampires, and the auxiliary fighter squadrons will not be completely re-equipped with jets until the end of 1951. Equally serious has been the lack of a jet night fighter.

Perhaps the most alarming aspect, however, has been the neglect of Bomber Command and Coastal Command. Both of these commands have been allowed to dwindle to a fraction of their peak war-time strength. Nor has a decrease in size been accompanied, as one might have expected, by the compensating factor of new equipment. Both commands have continued to fly aircraft which, though excellent in their day, fall seriously short of the performance demanded by the conditions of modern air warfare.

Happily, though not a moment too soon, the outlook is now beginning to improve and future historians may well compare 1951 with 1936 in its significance for the fortunes of the Royal Air Force. The parallel is indeed striking. Then, as now, a new generation of aircraft was coming forward—the Hurricanes, Spitfires, Blenheims and Wellingtons, to supersede the Gauntlets and Gladiators, Hinds and Heyfords. Plans were being finalized for the four-engine heavy bombers, the Halifax and Stirling, just as today the first four-engine jet bombers are being forged. Then, as now, the delay in "freezing" types for production, whether intentional, as has been hinted in the Air Estimates, or due to force of circumstances, is likely to pay dividends in any future conflict. Its net result is to keep the delaying country always one jump ahead of the country which has "frozen" its designs too soon. Despite its initial superiority, the country which is first in the field with the exploitation of any new development in aircraft design is always outclassed eventually by the aircraft which have the advantage of two or three years' more development before being put into squadrons. The mistake of the Luftwaffe chiefs in "freezing" their key types too soon, to see them outclassed in actual warfare, is the classical example.

With these considerations in mind, there is perhaps less reason for alarm at the reports of the performances of Russian jet fighters in Korea, and the possession of large numbers of jet bombers by the Russian Air Force. For to pursue the historical parallel a stage farther, did we not hear similar reports of the ascendancy of the Me. 109 and the Do. 17 in the testing-ground of the Spanish Civil War?

So much for the slightly longer-term aspect. Now let us turn to the re-equipment position at the present time.

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The De Havilland Venom jet fighter-bomber is to replace the Vampire in R.A.F. Squadrons at home and overseas. Deliveries are scheduled to begin in the autumn

The Meteor Mk. II Night Fighter, which seats pilot and radar observer in tandem, has stepped up the speed of night interception by 150 m.p.h.

The Vampire N.F.10 night fighter is now going into service with some squadrons of Fighter Command. Its cockpit layout is similar to that of the Mosquito, which it has replaced

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JET FIGHTERS

Since early in 1951, the first-line day interceptor fighter squadrons of Fighter Command have been equipped with the Gloster Meteor, Mark 8. The Mark 8 is a development of the Mark 4, which has been the standard fighter since 1946-47. Retaining the Derwent engines and the four 20-mm. cannon of its predecessor, the Mark 8 can scarcely be said to represent any startling advance on the Mark 4. It is likely to remain our standard day interceptor fighter for some time to come. In the meantime, there is some possibility that it will be supplemented by North American F-86 Sabre jet fighters from the U.S.A.

Jet fighter-bomber squadrons of the Royal Air Force, now flying Vampires, are soon to commence re-equipment with the D.H. Venom F.B.1. Though superficially similar to the Vampire, the Venom is a much more advanced design with the more powerful Ghost engine in place of the Goblin and a new high-speed wing section. Finned, wing-tip tanks conform to the latest aerodynamic fashions. The Venom promises to be one of the most formidable of ground-attack, rocket-firing jet aircraft and will be a welcome addition to R.A.F. squadrons at home and overseas.

ALL-WEATHER JET FIGHTERS

The modern conception of an "all-weather" jet fighter, carrying both pilot and radar observer and a comprehensive range of radar search and navigational equipment, now includes the night fighter classification in its scope. For seven years the night-fighter squadrons of the R.A.F. have been equipped with the D.H. Mosquito. Re-equipment with jet aircraft, long overdue, is now taking place. Squadrons are receiving two types of jet night fighter, the Meteor, Mark 11, which seats pilot and radar observer in tandem, and the Vampire night fighter (N.F.10), which seats them side by side, as in the Mosquito. The introduction of these two types has increased night-fighter speeds by about 150 m.p.h. and lessened the opportunities of enemy bombers accordingly.

Another promising "all-weather" jet fighter in which the Royal Air Force has shown an interest is the Canadian CF-100 Canuck. Unfortunately, this type has met with a slight setback as one of the prototypes crashed on a test flight recently. Equipped with two Rolls-Royce Avon turbojets, the Canuck is one of the most powerful fighters in the world.

PHOTO RECONNAISSANCE

The importance of this work in modern war cannot be over-estimated and that this is duly recognized is shown by the great strides which have recently been made in the Royal Air Force. Photographic squadrons, until fairly recently equipped with Spitfires and Mosquitos, have now taken delivery of the Meteor P.R.10, photographic version of the famous jet fighter. For long-range work, the Canberra P.R.3 has now been announced.

LIGHT BOMBERS

Although for certain types of operation, notably Army close-support and ground attack against tank formations, the work of the light bomber has now been taken over by rocket-firing jet fighters, such as the Vampire and Venom, there is still an important place for the tactical bomber with a precision bomb-aimer. Such an aircraft can also undertake pathfinder and marker duties for a heavier bomber force.

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These duties are to be undertaken by the English Electric Canberra B.2, the first jet bomber of the R.A.F., which is scheduled for delivery to squadrons during this summer. The outstanding performance of this aircraft makes it an invaluable contribution to the striking power of Bomber Command, and current arrangements for its large-scale production by the Handley-Page, Avro and Short factories as well as by the parent concern, indicate that it is accorded an important place in Western Union defence strategy. Additionally, it has been chosen for production in the U.S.A. by the Glenn Martin factory, under the designation B-57. In the U.S.A.F. it will supersede the B-45 Tornado.

MEDIUM BOMBERS

With the addition of the Washington, which is the R.A.F. version of the American B-29 Superfortress, an important strengthening of Bomber Command striking power has been achieved in this category. Although it can only be regarded as an interim replacement type until the long-range jet bombers are available, the Washington represents a notable advance on the Lincoln, hitherto

The English Electric Canberra B.2—The first Canberra Squadrons of Bomber Command will form up this summer

the only type in the squadrons. So long a target for critics, the Lincoln lacked the speed, range and crew comforts provided by the Washington, though the increased complication and larger crew of the Washington calls for a more elaborate conversion training.

HEAVY BOMBERS

If we consider the American B-36 to be a representative of this category, there is no bomber of this size and carrying capacity in service with the R.A.F. today.

MARITIME RECONNAISSANCE

Coastal Command, so long neglected, has at last been re-equipped with the Avro Shackleton which is replacing the Lancaster A.S.R.3 in landplane squadrons of the command. No replacement is available for the trusty Sunderland flying-boat. The flying-boat seems to have suffered an eclipse in military as in civil aviation, so far as this country is concerned. The Shackleton, from the same family as the Lincoln, makes more concessions to crew comfort which is so essential on long oversea patrols, and it should have a better performance with four Griffon engines in place of the Merlins. It is well equipped with A.S.V. radar. Its appearance in the squadrons has been delayed by what one imagines to be

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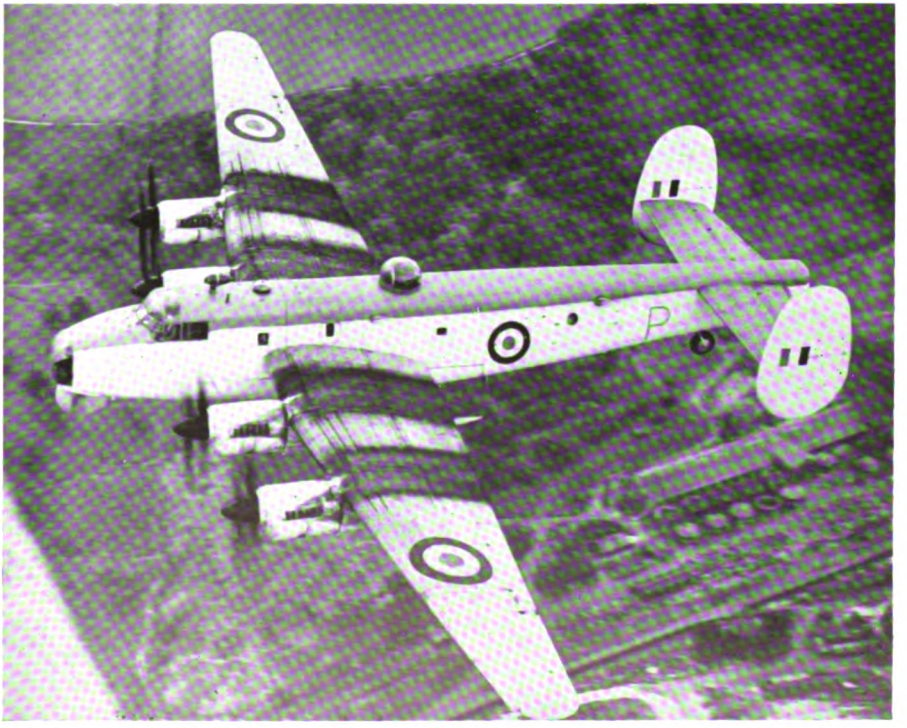
Supplied to the R.A.F. under the U.S. Military Aid Programme, this Boeing Washington equips Squadrons in Bomber Command until replaced by British four-jet bombers

differences of opinion about the nature of its defensive armament. At all events, the prototypes flew with several varieties of turrets and forward guns. The current version is equipped merely with a dorsal turret.

It was announced in the Air Estimates that Coastal Command is also to receive deliveries of the Lockheed Neptune twin-engined maritime reconnaissance aircraft from the U.S.A. This aircraft is remarkable for its long range, and one of them, *Truculent Turtle*, is the present holder of the world's long-distance record of 11,228 miles. The Neptune has not been delivered to the R.A.F. as yet, but it should be in service by 1952.



The Avro Shackleton which is replacing the Lancaster A.S.R.3 in landplane Squadrons of Coastal Command

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A HINT OF THE FUTURE?

The Delta wing configuration is likely to play an important part in future fighter and bomber designs. This Avro 707B research aircraft is said to foreshadow a new bomber now under development.

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METEOROLOGICAL RECONNAISSANCE

This branch of Coastal Command's work has until recently been performed by Halifax aircraft. Now the new meteorological reconnaissance version of the Handley-Page Hastings has replaced the Halifaxes. The Hastings is in every way better suited for the task of long-range ocean patrol and, being a converted transport, its capacious fuselage can accommodate a wide range of meteorological and radio equipment, as well as providing more comfort for the crew.

A special version of the Brigand light bomber has gone into service with overseas meteorological reconnaissance units. The Brigand (Met.) 3 is at present giving good service on weather flights over the Indian Ocean from a base in Ceylon.

TRANSPORTS

For some years Transport Command, so important in the war period, has been the Cinderella of the Royal Air Force. It was admitted in the Air Estimates speech that its strength had been allowed to dwindle to a greater extent than that of any other Command and it was the first to suffer during the economy cuts of 1949, despite its important work in the Berlin air-lift. This tendency, however, has now been halted and it is to be restored to its former importance.

Of the types in service with Transport Command, the Hastings, first introduced during the Berlin air-lift, is now firmly established as the standard long-range transport in which capacity it has completely superseded the York. Likewise the Valetta, the military version of the Viking, has superseded the Dakota, both at home and overseas, though a few Dakotas remain in the Far East.

One interesting development in the transport field is the announcement that the three Saro Princess flying-boats now under construction, originally intended for operation by civil airlines across the South Atlantic, are to be handed over on completion to R.A.F. Transport Command. With their long range and huge capacity, these boats could certainly be an asset on the trunk routes of Transport Command, and their performance on such duties will be awaited with keen interest by students of the great flying-boat versus landplane controversy the world over.

TRAINERS

During any programme of expansion and re-equipment it is essential that the flying training techniques keep pace with the new design philosophies and combat requirements in the operational field. The special problem of the jet aircraft was quickly solved by the R.A.F. in the shape of the Meteor T.7 dual-control jet trainer which has now been in service for some years. It will probably be followed by the trainer version of the Vampire, which offers the special advantages of side-by-side seating for instructor and pupil, now standardized on basic and applied trainers. The Vampire Trainer is currently undergoing evaluation tests by the Royal Air Force.

Having served as the standard basic trainer for four years, the Prentice is now due for replacement and it will be followed in 1953 by the new Percival P.56, as yet unnamed. The higher power of the P.56 compared to the Prentice enables it to take still farther the modern trend in R.A.F. flying training whereby as many hours as possible are flown on the basic type in proportion to the total training syllabus. In the days of the Tiger Moth, the ratio between initial and applied training was sixty hours followed by 140 hours on the Harvard. The Prentice changed this to 100 hours at each stage, thus leading to an economy in the use of applied trainers without loss of efficiency in the training procedure. It may be expected that the P.56 will improve this ratio still farther.

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RE-EQUIPPING THE ROYAL AIR FORCE

Table of Data for New Aircraft

Type	*Purpose*	*Power Plant*	*Wing Span*	*Loaded Weight*	*Max. Speed*	*Range*	*Armament*
De Havilland VENOM F.B.1	Single-seat jet fighter-bomber	One D.H. Ghost	41 ft. 9 in.	—	—	—	Four 20 mm. cannon and rockets/bombs
Gloster METEOR F.8	Single-seat jet fighter	Two R.R. Derwent 5	37 ft. 2 in.	—	—	—	Four 20 mm. cannon
North American SABRE	Single-seat jet fighter	One General Electric J-47	37 ft. 1 in.	16,500 lb.	680 m.p.h.	1,250 miles	Six 12.7 mm. machine-guns and 16 rockets
Armstrong Whitworth METEOR N.F.11	Two-seat jet night fighter	Two R.R. Derwent	43 ft.	—	—	—	Four 20 mm. cannon
De Havilland VAMPIRE N.F.	Two-seat jet night fighter	One D.H. Goblin	38 ft.	—	—	—	Four 20 mm. cannon
English Electric CANBERRA P.R.3	Jet photo-recce	Two R.R. Avon	—	—	—	—	—
Gloster METEOR P.R.10	Single-seat jet photo-recce	Two R.R. Derwent	43 ft.	—	—	—	—
Boeing WASHINGTON	Medium bomber. Crew: 10	Four 2,200 h.p. Wright Cyclone	141 ft. 3 in.	135,000 lb.	342 m.p.h.	3,400 miles	Twelve 12.7 mm. m.g. and 22,000 lb. bombs
English Electric CANBERRA B.2	Light jet bomber. Crew: 3	Two R.R. Avon	64 ft.	—	—	—	—
Avro SHACKLETON M.R.1	Maritime reconnaissance. Crew: 10	Four R.R. Griffon	120 ft.	—	—	—	Two 20 mm. cannon in B.17 dorsal turret. Bombs and depth charges
Lockheed NEPTUNE	Maritime reconnaissance. Crew: 7	Two 3,250 h.p. Wright Turbo-Cyclone	100 ft.	64,100 lb.	338 m.p.h.	3,930 miles	Eight 20 mm. cannon; two 12.7 mm. m.g. Sixteen rockets. 8,000 lb. bombs
Saro PRINCESS	Transport flying-boat. Crew: 8	Eight Bristol Proteus	219 ft. 6 in.	315,000 lb.	380 m.p.h.	5,500 miles	—
Boulton Paul BALLIOL T.2	Two-seat Applied Trainer	One 1,280 h.p. R.R. Merlin 35	39 ft. 4 in.	8,336 lb.	305 m.p.h.	525 miles	One .303 m.g., rockets
Percival P.56	Two-seat Basic Trainer	One 550 h.p. Alvis Leonides	30 ft.	—	—	—	—
Vickers VARSITY T.1	Advanced Crew Trainer	Two 1,950 h.p. Bristol Hercules 264	95 ft. 8 in.	37,500 lb.	290 m.p.h.	1,500 miles	Twenty-four 25 lb. practice bombs

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There has long been a requirement for a new applied trainer in the R.A.F. to replace the Harvard, which has now been the standard aircraft in this category for twelve years. The relatively low power and performance of the Harvard no longer bridge the gap between the basic stage and the final conversion to operational types of aircraft. This is soon to be remedied by the introduction of the Balliol T.2 in the flying training schools. A pre-production batch of Balliol aircraft is already in service with the R.A.F. for high-speed gunnery training, and these will be followed by the applied trainer versions later in the year. Highly aerobatic, and equipped with a Merlin engine of more than double the power of the Harvard's Wasp, the Balliol approaches in performance the war-time Hurricane fighter.

In the crew training field, where pilots of heavy aircraft, navigators and air signallers team up together for the first time, the veteran Wellington is soon to be replaced by the Varsity. An important feature of the Varsity is its tricycle undercarriage, which brings bomber training into line with modern operational types. The Varsity may be expected in full-scale service by 1952.

WHAT OF THE FUTURE ?

By the end of the present decade, perhaps earlier, the majority of the new aircraft at present or shortly going into service with the expanded R.A.F. will be obsolescent. Can any useful predictions be made as to their successors? One thing at least is sure; the jet fighter manned by a pilot will have given way to the rocket missile guided by radar and fitted with proximity fuses. The duty of the fighter is likely to shift to long-range escort of bomber formations, perhaps in the form of the "battleplane" envisaged in the theories of the American military aviation strategist, Major Alexander P. de Seversky. Major Seversky foresees the need for a large, heavy "battleplane" not unlike the bombers which it will accompany, the object of which is to carry electronic devices to counteract defensive radar, to ward off guided missiles by firing off their proximity fuses prematurely and to help in sighting targets. It seems likely that electronic counter-devices can provide a useful defence against the guided missile, thus giving the bomber another lease of life.

Whether the Royal Air Force will develop along these lines only the future can tell us. But whatever the outcome in the struggle for air supremacy, it will never lack the backing of British scientific genius.

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[R.N.Z.A.F. Photo

R.N.Z.A.F. RIFLE SHOOTING CHAMPIONSHIPS

From left: Chief of Air Staff, Air Vice-Marshal D. V. Carnegie, C.B., C.B.E., A.F.C., R.A.F.; Air Commodore S Wallingford, C.B., C.B.E., R.N.Z.A.F., Air Member for Personnel and Chairman of the R.N.Z.A.F. Rifle Association; Group Captain A. B. Greenaway, O.B.E., R.N.Z.A.F., Commanding Officer R.N.Z.A.F. Station Wigram, and the 1951 Champion shot

[R.N.Z.A.F. Photo

The Whenuapai Team which won the annual R.N.Z.A.F. Inter-Station Rifle Championship From left, standing: Flight-Lieutenant H. D. Caird (U.K.); Sergeant K. J. Gilmour (Auckland); Flight-Lieutenant R. R. Smith, M.B.E. (Auckland) Kneeling: Leading Aircraftman C. G. Robertson (Wellington); Sergeant T. F. Langley (Auckland)

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OUR COMMONWEALTH AIR FORCES

ROYAL NEW ZEALAND AIR FORCE

R.N.Z.A.F. RIFLE MEETING: TRENTHAM, 1951

FAVOURED with excellent weather but with tricky winds, the annual inter-station Rifle Meeting of the Royal New Zealand Air Force was held at Trentham Range, near Wellington, from 19th to 22nd February. Teams from all stations took part, over ninety competitors attending.

The organization of the Meeting was very successful, and the assistance provided through the Army Camp Commandant was greatly appreciated.

The main events were the Inter-Station Team Match and the Individual Service Championship. The Team Championship was won narrowly by R.N.Z.A.F. Station, Whenuapai, and the Individual Championship by Group Captain A. B. Greenaway, O.B.E., Commanding Officer of R.N.Z.A.F. Station, Wigram.

Details are as follows:

Team Championship.—1, R.N.Z.A.F. Station, Whenuapai (Flight Lieutenant R. R. Smith, M.B.E., Flight Lieutenant A. D. Caird, Sergeant T. F. Langley, Sergeant K. J. Gilmour and Leading Aircraftman C. G. Robertson), 1,619 points; 2, R.N.Z.A.F. Station, Hobsonville (Warrant Officer F. B. Haycock, Warrant Officer P. B. Cullen, Sergeant D. J. Caughley, Sergeant J. S. Nicholson and Sergeant G. T. D'Anvers), 1,594 points; equal 3, R.N.Z.A.F. Station, Ohakea "B" team (Flight Lieutenant E. Lunn, Sergeant A. Cowley, Leading Aircraftman A. Marusich, Leading Aircraftman A. H. Young and Aircraftman 1st Class K. R. Humphries), and Air Department "A" team (Air Commodore S. Wallingford, C.B., C.B.E., Flight Lieutenant H. L. Homer, Flight Lieutenant I. S. Rockell, M.B.E., Pilot Officer A. C. Bush and Corporal M. C. Garford), 1,568 points.

Individual Service Championship (for the Watt Cup).—1, Group Captain A. B. Greenaway, O.B.E. (Wigram), 359; 2, Sergeant A. Cowley (Ohakea), 348; 3, Leading Aircraftman C. G. Robertson (Whenuapai), 343.

S.R.(b) Championship.—1, Leading Aircraftman C. G. Robertson (Whenuapai), 225; 2, Sergeant D. J. Caughley (Hobsonville), 223; 3, Flight Lieutenant H. L. Homer (Air Department), 222.

Prior to the conclusion of the Meeting on 22nd February, the Chief of Air Staff, Air Vice-Marshal D. V. Carnegie, C.B., C.B.E., A.F.C., R.A.F., visited the range and watched the competitors in action in the Service "Run-down" Match. He later presented the trophies and expressed pleasure at the keen interest shown.

A number of R.N.Z.A.F. riflemen entered for the National Rifle Association Championships the following week. An excellent showing was made by the Service competitors, two of whom, Warrant Officer F. B. Haycock and Sergeant D. J. Caughley, made the King's Fifty. In addition, seven of the R.N.Z.A.F. competitors qualified for the Service Fifty.

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ROYAL CANADIAN AIR FORCE

CANADA'S OBSERVER CORPS

A CIVILIAN Ground Observer Corps is being established in Canada which will operate under the control of the Royal Canadian Air Force Headquarters, Ottawa, and close liaison will be maintained with the other two Services and with the Civil Defence Co-ordination. It will be similar in organization and operation to the Royal Observer Corps of the United Kingdom, which proved its efficiency and effectiveness in the Second World War. The main purpose of the new Corps will be to supplement the R.C.A.F.'s radar early warning system by reporting aircraft movements and so provide great assistance to Canadian defence during time of war.

Total membership will be more than 150,000, and all positions except for a small field staff of Regular Force personnel and the Headquarters co-ordinating staff will be filled by civilians, whose services will be on a voluntary basis and recruited from men, women and youths not normally qualified for regular military service in war time. It will be grouped in four main areas—Eastern Canada, Quebec, Ontario and Western Canada.

A nucleus of an Observer Corps has been in existence for some time, through the services of Armed Forces, Department of Transport, R.C.M. Police and Hudson's Bay Company personnel located in northern areas, whose personnel have been reporting aircraft information to the R.C.A.F. These facilities will now be merged into the Ground Observer Corps.

In addition to supplementing the early warning radar system, the Corps would watch for possible airborne landings or parachute descents by enemy forces or agents, and would report suspicious activities on the two coasts. All these preparations are reminiscent of those which took place in the United Kingdom prior to the Second World War, and that this should be essential now on the far side of the Atlantic indicates very clearly the increased range of the potential enemy's aircraft in comparison with those of Germany in 1939.

RED INDIAN FIGHTER SQUADRON

A great deal has been accomplished by the R.C.A.F.'s No. 421 Red Indian Fighter Squadron since Air Marshal Sir Basil Embry, K.B.E., C.B., D.S.O., D.F.C., A.F.C., Air Officer Commanding-in-Chief of Fighter Command, dropped in for an informal visit to this squadron at Odiham early in March. At that time the typical British weather for the early part of the year had grounded the squadron's aircraft irritatingly frequently, but it enabled Sir Basil to meet and chat with all the Canadian pilots and ground staff. As the Squadron Commander, Squadron Leader Davidson, would put it: "The weather has since given them a break, and the squadron has really got cracking."

This squadron has been doing its share of showing the maple leaf roundel to the people of Britain, and seeing a lot of the country at the same time.

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The Red Indian pilots have carried out numerous cross-country navigation flights, to familiarize themselves with the intricate pattern of radar control over Great Britain and with the terrain. Among these, the flight to the R.A.F. Station at Leuchars, near Dundee, Scotland, proved one of the most interesting, although the time available did not permit keen golfers to fulfil their ambition of a round on the world-famed St. Andrew's golf course. They did, however, carry away a memorable impression of the hospitality of their R.A.F. hosts at Leuchars, and on the return flight the weather was good enough to enable them to see both the Irish Sea and the North Sea from their jet Vampires when at 30,000 feet, which indicates welcome improvement in the British weather.

TRAINING OF NATO AIRCREWS IN CANADA

On the European side of the Atlantic there is much interest in Canada's welcome assistance in training aircrews of the North Atlantic Treaty Organization. The fact that 131,000 aircrew were trained in the Second World War by the British Commonwealth Air Training Plan showed that Canada is particularly qualified to make this important contribution to our collective security.

Previous experience proved that the best places for flying training was in the Prairie Provinces, and as a number of flying fields with runways, hangars and buildings in a relatively good state of repair are still in existence there, enabling re-establishment to be done as speedily and economically as possible, all new flying schools will be located in Manitoba, Saskatchewan and Alberta.

Present plans provide for a build-up to an annual output of over 3,000 aircrew. That represents an increase of six times the figure for 1950 and fifteen times the figure for the previous year. This necessitates the opening of new flying schools, accompanied by a five-fold increase in ground crew training facilities and an expansion of administration establishments.

To facilitate maintenance and administration and to take advantage of more suitable weather, basic flying training schools will be grouped in the western part of the Prairie Provinces, while advanced flying schools will be grouped in the eastern part of this area.

Canada already has air training schools and operational stations or other units in operation or under construction at Goose Bay and to a very limited extent Torbay, in Newfoundland; at Summerside, in Prince Edward Island; at Dartmouth and Greenwood, in Nova Scotia; at Moncton (to a limited extent) and Chatham, in New Brunswick; at Bagotville, St. Hubert, St. Johns and Dorval, in Quebec; at Rockcliffe, Uplands, Arnprior, Trenton, Downsview, North Bay, Centralia, Clinton and Aylmer, in Ontario; at Winnipeg, Gimli and Rivers, in Manitoba; at Edmonton, Calgary and Suffield, in Alberta; and at Patricia Bay (again to a limited extent) and Vancouver, in British Columbia. There are, of course, other headquarters and depots in addition.

The new schools to be re-established are flying training schools at Claresholm and Penhold, in Alberta, and Moose Jaw, in Saskatchewan. Advanced flying training schools are to be at Saskatoon, in Saskatchewan, and Portage la Prairie, in Manitoba, with a gunnery school at MacDonald. The flying training school at Gimli will later be converted to an advanced training school. A large air navigation school will be established at Winnipeg in addition to the present school at Summerside, P.E.I.

The facilities of all the stations will be used to the fullest extent possible. For example, by improved training methods it is expected to have pupil populations of 300 at the flying training schools, as compared with 240 during the Second

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World War. The limiting factor at each school will be the number of hours of flying that physically can be fitted in having regard to the weather and capacity of the airfield.

Early in May, Defence Minister Brooke Claxton attended the presentation of wings to the first group of graduating aircrew students under Canada's air-training programme for nations of the North Atlantic Treaty Organization. The ceremony was held at R.C.A.F. Air Navigation School, Summerside, Prince Edward Island. The wings were presented by Air Marshal W. A. Curtis, C.B., C.B.E., D.S.C., E.D., Chief of the Air Staff, R.C.A.F., and in addition to trainees from the United Kingdom there were pupil navigators from Belgium, Norway and Italy. A further graduation ceremony took place early in June. When the original plan to train 100 aircrew from continental nations and 200 R.A.F. aircrew was increased by 1,100 a year, it was decided that all additional training vacancies available during 1951 should be allocated to R.A.F. trainees.

R.C.A.F. Appointments

Since the issue of the last number of this journal, notification of the undermentioned appointments have been received:

CANADIAN JOINT STAFF, LONDON, ENGLAND

Air Commodore M. Costello has been appointed as Air Member of the Canadian Joint Staff in the United Kingdom, *vice* Air Commodore Hurley, C.B.E., whose new appointment will be notified later.

Wing Commander H. Malkin, D.F.C., A.F.C., after six months as military observer with the United Nations Commission in Korea, has also been posted for duty with the Canadian Joint Staff in London.

426 THUNDERBIRD SQUADRON

Wing Commander J. K. F. MacDonald was appointed to take over command of 426 Squadron on 1st June, 1951.

R.C.A.F. STATION, WHITEHORSE

Wing Commander R. J. Gray, M.B.E., has been appointed Station Commander of R.C.A.F. Station, Whitehorse.

SUPREME HEADQUARTERS, ATLANTIC POWERS, EUROPE

Wing Commander G. F. Jacobsen, D.F.C., has been appointed to the operations and planning staff of S.H.A.P.E., in Paris.

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PACIFIC MERCY FLIGHTS

By Flying Officer G. Bentley, R.N.Z.A.F.

WHEN tropical storms blow up in the scattered islands of the Fiji Group, some 1,150 nautical miles north-west of Auckland, the presence at Suva of a flying-boat squadron of the Royal New Zealand Air Force gives the islanders a greater sense of security than they have ever known before.

In one week-end alone last year as many as four aerial searches were undertaken for missing canoe and launch parties—all successfully.

Frequently, in these remote Pacific territories, residents become seriously injured or critically ill, and an S.O.S. rushed along the "bush telegraph" to the health authorities, and relayed to the Commanding Officer at Lauthala Bay, results in an Air Force Catalina becoming suddenly airborne and, not infrequently, in another life being saved.

Known within the squadron as "mercy missions," and described in official records without embellishment, these flights, often undertaken in hazardous conditions and to unknown waters, fall into the category of "extraneous tasks." The principal function of No. 5 (Flying-Boat) Squadron is maritime reconnaissance. Its secondary role is search and rescue under the I.C.A.O. Agreement of 1947. Sandwiched between these regular operations are the "mercy missions"—emergency flights to help an isolated island people—major missions among which in 1950 averaged one a month.

PICTURESQUE TRIBUTE

"The roar of your engine to me that morning is an encouraging hymn, that brings endless joy and happiness to my heart. . . . My son is, I know, progressing well. May I hope you a 'happy landing' with our Lord's blessing."

This message, couched in picturesque English, was sent by an islander to the Commanding Officer of R.N.Z.A.F. Station, Lauthala Bay—where No. 5 Squadron is based—expressing gratitude for the Commanding Officer's timely action in despatching a Catalina to distant Lakemba Island, to fly the native's son to hospital.

"I know what you have done—I cannot repay in this world—but please do receive the humblest and sincerest thanks that I cannot well express in writing." he concluded.

This is not the first time that the Commanding Officer's mail-tray has contained a word of thanks from residents of the Fiji and neighbouring groups. A European whose wife and daughter were uplifted from Wakaya Island—forty-five nautical miles from Suva—in seriously ill condition, wrote:

"When I sent my launch to Levuka for aid there was no thought in my mind that you would not send a plane. I took it for granted that my request would not be in vain. I might say that the R.N.Z.A.F.'s response to calls of this nature has given Fiji residents, particularly those in outlying islands, a feeling of security. It certainly has in my case, and now that my wife and daughter are out of danger I can express more fully my appreciation of the service you have done me. My wife received immediate attention on arrival, and but for this I doubt whether her life could have been saved."

AIR-LIFT FOLLOWS HURRICANE

A classic example of the "mercy mission" which is now a regular operation of

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A TYPICAL ISLAND OF THE LAU GROUP
The Volcanic origin of the island of Ogea Levu is apparent in the photo. The Island has one village which is shown bordering the white sandy portion in the centre

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No. 5 Squadron was the air-lift to residents of the Lau Group when a hurricane swept those islands some time ago, devastating large areas.

When news of the disaster reached Lauthala Bay, the Commanding Officer of the station (then Wing Commander J. M. Checketts, D.S.O., D.F.C.) offered immediate assistance to the Governor of the Colony (Sir Brian Freeston, K.C.M.G., O.B.E.). Emergency flights with food and medical stores were made to eleven islands of the group over the three days of the air-lift. Five tons of rice, 9,000 pounds of biscuits, 3,864 pounds of sugar and 340 pounds of tea were carried. On two islands the supplies were dropped on the beach because the waters were unsuitable for a landing.

Late in 1949 the squadron was called to the aid of a sinking freighter, the former New Zealand coastal ship *Awahou*, of 410 tons gross, which was reported to be foundering 200 miles north of Fiji. R.N.Z.A.F. Catalinas searched for and located the distressed vessel, directed rescue ships to the scene, established that the *Awahou's* peril was not immediate, and circled her in continuous vigils of fourteen hours or more until the rescue ship arrived and took off the passengers.

VARIETY FOR AIRCREWS

I have mentioned that major mercy flights from Lauthala Bay in 1950 averaged one a month. A survey of the squadron's records shows that there was variety for the crews to whom these extra tasks fell.

The first, in January, was to the island of Taveuni, 120 nautical miles from Suva, where an Indian woman was dying from knife wounds. A quick flight was made in heavy rain, with poor visibility and low ceiling, and the woman was rushed to hospital.

Four days later the squadron was called on to undertake a mission of an unusual nature. A dangerous lunatic had been apprehended on an outlying island and it was necessary to remove him speedily to safe custody. With two stalwart Fijian policemen as escort, the madman was flown to Suva, certified and confined in the local asylum.

In February the squadron answered a call to Waiyevo, on the west coast of Taveuni, where a woman lay seriously ill. As there was no harbour or sheltered inlet in this vicinity, the aircraft had to let down through heavy rain and alight offshore in the open sea. The sick woman was taken aboard and flown to Suva—again through bad weather.

Two major searches for missing small craft were undertaken by the squadron last year, and both were successful. In the hurricane season, disaster often comes quickly to operators of small craft, and many a swamped crew have been found clinging to their upturned canoe and taken aboard a flying-boat.

IMPROVISED SURGERY

The last but one of the mercy missions during 1950 was the longest ever undertaken by the squadron—a 4,600-mile ocean flight to save the life of a woman on Penrhyn Island, in the extreme north of the Cook Group. The call for help was radioed from Penrhyn to Rarotonga and relayed to Wellington, New Zealand's capital. Air Department signalled Lauthala Bay and a Catalina of No. 5 Squadron was quickly readied for the flight, taking off late that day on the first stage to Samoa with a European doctor and theatre sister and a Fijian medical practitioner aboard, together with the surgical equipment necessary for the operation. Aitutaki was reached on the second day, and the third day the aircraft flew the remaining 600 miles to Penrhyn.

The Catalina made a landing in a lagoon twelve and a half miles from shore

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Airlift to Lau Islands—To facilitate the unloading of food, rubber life-rafts were loaded with supplies and in one or two instances towed ashore by Fijian swimmers. This is being unloaded at Oneata where the children swam over a mile to the aircraft and helped unload over 1 ton of supplies. Their courtesy and respect for Ratu Cakobau was inspiring

Catalina being prepared for flight. Landing wheels are used on landing ground and detached when plane enters water. Fijians have become expert in this work

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and the medical party climbed out in a waiting launch where they carefully stowed their equipment. Half-way across the lagoon, however, the engine failed, and the journey was continued under sail. The patient, a 26-year-old woman, was found to be very ill indeed. A difficult childbirth had been followed by dangerous complications. Facilities on the island for major surgery were lamentably few. With the competence of her kind, the nursing sister improvised a table, and the English doctor operated, his Fijian assistant administering the anæsthetic.

The party spent the night on Penrhyn, and the next day the woman was already showing signs of recovery. Dr. Doran said on his return to Suva that if the operation had been delayed one day more the woman must have died.

Just how much the isolated island communities depend on the ubiquitous Catalinas is shown by the fact that before Dr. Doran left Penrhyn the day following the operation he spent two hours treating a procession of out-patients who quickly came to take advantage of his presence there.

Whereas most of this squadron's missions are cloaked in the traditional reticence and anonymity of the Service, this and its last mercy flight of the year both "hit the headlines." The last was in New Zealand. A Catalina had been flown to Auckland from Suva and its crew had been granted leave to visit their homes. From the lonely Chathams, 450 nautical miles south-east of Wellington, came an emergency call. A man's sight might be saved if he could be rushed to New Zealand from the Chathams for expert eye surgery. The patient had a penetrating eye wound inflicted with a shearing blade that had snapped in use. It was a lucky chance that the R.N.Z.A.F. had an aircraft in New Zealand that could undertake such a trip. The crew were hastily recalled from leave and the Catalina left on its nine-hour return journey, landing on Chathams lagoon which serves as the islands' emergency landing area. The return flight was made in turbulent weather, but the passenger, his eyes bandaged, was in no mood to care. A few hours later he was in a Wellington hospital and the operation was safely over.

R.A.F. PARTICIPATION

During the Second World War thousands of New Zealand airmen served with the R.A.F. in various parts of the world. A few R.A.F. officers and N.C.Os. were seconded to the R.N.Z.A.F., but only as individuals. Last year, for the first time, a complete R.A.F. detachment served for a period with an R.N.Z.A.F. "home" squadron—for Lauthala Bay is officially a New Zealand base. By arrangement between the British and New Zealand Governments, two R.A.F. Sunderlands and their crews, based at Hong Kong, were exchanged with Catalinas and crews of No. 5 Squadron—and the Englishmen spent a few months at Lauthala Bay. When, one Sunday morning, the Assistant Colonial Secretary to the Fiji Government advised that a police launch with seven people aboard was twenty-four hours overdue, and requested a search, the task was given to an R.A.F. Sunderland captain, Flying Officer J. R. Douche. The missing launch had, in turn, gone in search of a missing fishing craft, aboard which were a man and three children. A search of those islands and inlets that might afford shelter from the hurricane revealed the two vessels anchored in a small, obscure cove. The seas were too heavy for the Sunderland to land, and as the occupants were seen to be safe and in good spirits, the captain notified their exact position and returned to base.

The R.A.F. figured in a further mercy mission when a woman on Moturiki Island, thirty nautical miles from Suva, developed spinal meningitis and was in serious plight. Flight Lieutenant J. Poyser took off in an R.A.F. Sunderland and uplifted the patient, who could not have made the journey by any other means.

These and other such missions are evidence that a remotely based squadron

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can, while carrying out routine operational training flights, give valuable service to the community in which it lives and works.

CLIMATE AND TERRAIN

With the closing of our forward operation Pacific bases, Lauthala Bay is today the only station of the R.N.Z.A.F. located outside New Zealand. It is situated on the Suva Peninsula, on the southern coast of the island of Viti Levu.

Viti Levu is the largest, highest and most important island of the Fijian Group. Extending ninety-eight miles in length and sixty-seven miles wide, it is mountainous and heavily wooded, with peaks climbing more than 4,000 feet. For this reason aircrews are advised when making base to follow the coast and not fly across country until they are completely familiar with the terrain. For the same reason they must come out of cloud well before E.T.A.

Viti Levu has a tropical climate. From May to December the south-east trades blow continuously and there are normally good weather conditions. From December to April the south-east trades blow intermittently, conditions are turbulent, and this period is known as the "rainy season." The hurricanes come mostly at this time. Flying conditions are generally very good, and are, in fact, infinitely better and more reliable than in New Zealand.

There are two types of reef at Viti Levu—inshore and offshore. The inshore reefs exist around the entire south coast and are a reliable guide in thick weather. The offshore reefs exist off the north coast, and are not a reliable aid to navigation. They are broken and scattered and in thick weather would cause confusion if an attempt were made to follow them.

NATIVE LABOUR

In common with the other Air Forces of the British Commonwealth, the R.N.Z.A.F. labours under a severe shortage of skilled tradesmen. At Lauthala Bay, however, this is a less pressing problem, for native labour is available, and in this respect No. 5 Squadron enjoys an advantage unique among our "home" squadrons. At Lauthala Bay, where the ground staff is sometimes called on to assist with the emergencies of visiting non-Service aircraft, local civilian workers are employed who may be Fijians, Indians, Chinese or half-castes.

No account of Lauthala Bay would be complete without mention being made of the ever-cheerful native beaching-crew, about twelve in number, composed entirely of woolly-haired Fijian youths who can fairly be classed as experts in the art of beaching and slipping flying-boats. Although these operations are always done under supervision, the head boy invariably has the situation in hand and his team receives warm praise from transient crews.

Fijians are also employed exclusively as marine-craft crew, i.e., as coxswains and deckhands of control launches and maintenance barges. These men have been accustomed to handling small craft since early childhood and seem to possess an uncanny degree of anticipation and awareness, no doubt partly hereditary, when faced with difficult assignments. Particularly during night flying, when visibility is often low and bearings uncertain on the water, the Fijian coxswains find their way and lend aid with remarkable sagacity to aircraft captains.

The temperature at "the Bay," as it is known colloquially among airmen, is usually around 75° F., and the water is invitingly warm. Fairly obviously, swimming and yachting are the principal station sports. Aircrew personnel, all categories, serve there for terms of two and a half years and officers and airmen in ground trades serve one-year terms. It is a pleasant environment and personnel appear to find life there very congenial.

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THE JOINT-SUPPLY SERVICE

By Flying Officer P. A. Tunbridge, Assoc.I.Mech.E., Grad.R.Æ.S.

WITH the setting-up of a European Defence Organization the problem has arisen of closely integrating the administration of the allies concerned. Not the least of the difficulties to be encountered will be that of devising a supply service. As a preliminary step to the setting up of a completely unified department of logistics, non-specialist items of equipment only will be considered. The R.A.O.C. and the relevant departments of the Royal Navy and Royal Air Force will continue to deal with the technical equipment.

The whole range of barrack equipment should be surveyed by a European Defence Supply Committee. Any one item should be selected, that because of its suitability and generality could be standardized and made a universal issue to all the Allied Services. Let it be assumed that the ordinary water-bucket could be such an item. An assessment should then be made of the requirements of this item for a period of twelve months. The figure reached would undoubtedly be sufficiently high to enable a depot to be set up which dealt almost entirely with the supply of this item. (A shadow supply, or two-point holding system, could be introduced.)

The existing supply methods would not be disturbed, and it would be only the selected items that would be supplied under the new organization. Standardized forms would be issued for the supply of this item to all interested Services. As the organization became to be proved a sound one, other items of equipment could be added to the range, so that eventually all barrack stores would be included. Probably rations and non-aviation-type fuel could be put on a similar basis.

Some of the advantages of a joint-supply service are:

1. In the case of the Army and the Royal Air Force, the Ministry of Supply consolidates requirements and places contracts. This would be obviated as contracts could be placed direct by the senior supply officer dealing with the complete requirements of all forces.
2. A Joint-Service vote could be accorded by Parliament for domestic supplies. This would lead to greater economies as surpluses of equipment held in depots by one Service would be obviated.
3. Duplication of work avoided, saving in man power.
4. A considerable simplification in the supply procedure could be effected. Hastening action on the depot would be more positive.
5. Contracts for the item of equipment would be placed directly by the senior supply officer. This will enable a speedier forecasting and buying system to be instituted so that on a rising market economic purchases may be made.
6. The return to depot of unserviceable and repairable equipment on a large scale should make possible more effective repair organizations.
7. A system of maintaining depots on a two-point basis would ensure duplication of supplies in the event of a depot being bombed or communications interrupted.

The Commanding Officer of a depot would lose his Service identity and assume a Joint-Service status as Supply Commandant. Each Supply Commandant would be responsible to one Chief Supply Commandant who, in turn, would be answerable to the Joint Defence Council. The staff of Supply Commandant would include personnel of all Services.

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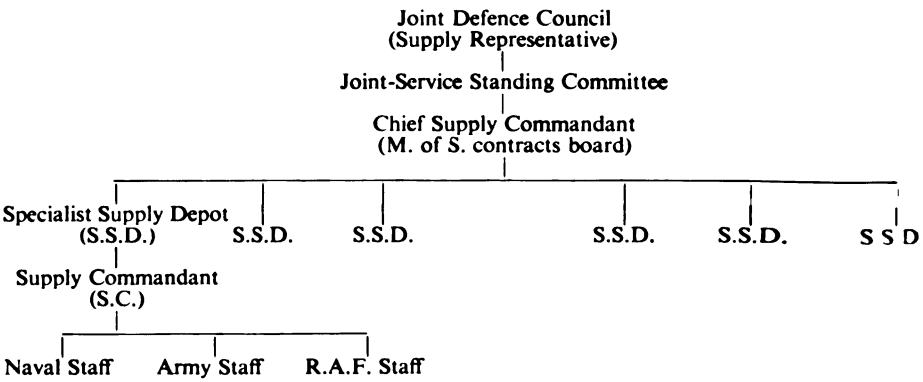
Joint recognition of personnel of the Services concerned would be necessary so that a completely integrated staff could deal impartially with all questions of supply to any Service.

By the selection of only one item of equipment, at first, to be placed on a joint user and supply basis, the reorganization involved would not be irrevocable. The policy of slowly, slowly, catchee monkey, so employed, could well result in the eventual establishment of an overall Joint Supply Service.

ENVISAGED JOINT-SUPPLY ORGANIZATION



(Service staffs to include allied representatives)

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INTERDICTION

By Wing Commander E. A. Howell, O.B.E., D.F.C.

INTERDICTION, or the prevention of movement, has emerged from the last war as one of the most valuable functions of air bombardment. It has been clearly demonstrated that bombers can prevent or at least seriously interfere with the extensive use of rail movement by the enemy.

In a "Joint Statement on Strategic Bombing," issued by both British and American Air Forces in 1945, it stated: "The German counter-invasion plan was to bring their reserve divisions to the battlefield at the rate of forty-eight trains a day; this was cut by bombing to six trains a day." Operation "Clarion" was a further example in Germany in the winter of 1944-45. General Arnold, in his Third Report in November, 1945, said : "War production was cut in half. Major-General Peters said traffic was reduced 90 per cent. Operation 'Clarion' marked the end of large-scale mobility for the German army." Interdiction thus affects both the mobility of armies and the supply of industrial materials, especially in countries which have a highly developed railway system.

Movement by road, however, is a very different problem. The flexibility of road transport and the complexity of road networks combine to make interdiction much more difficult. Focal points are far too numerous to be profitable targets for destruction. Temporary repairs are far too easily made. Bridges, of course, remain natural targets, but road traffic can soon be diverted on to pontoon or other temporary bridges less easily destroyed and more easily repaired.

Nevertheless, the final phases of the war showed that—given the necessary air superiority and enough aircraft available—extensive road movement could be seriously interrupted by day in forward areas by fighter-bomber patrols.

In the event of a war with Russia, or China, or any other power employing massive infantry formations, road interdiction should be given even greater emphasis than before. For one thing, the lessons of the last war have probably been learned and rail movement will not be relied on to the same extent. In any case, the rail network, being much less complex than in Western Europe, should be comparatively easily dealt with. This means that both in forward and in rear areas, road movement will tend to be even more employed than previously. The role of road interdiction thus assumes new importance for the air forces.

The soldier achieves excellent delaying results by the laborious process of mining. If he has time and material to prepare extensive minefields he can greatly restrict the enemy's movement over roads and over open country. There is no question that the air forces could accomplish a corresponding task with much less time and effort and in areas out of reach of the soldier on the ground. Minelaying in the sea is an important part of the air effort to win the sea battle. Minelaying on land should become an important part of the air effort to win the land battle.

One reason why this was not regarded as a normal function of air support in forward areas or of air action in rear areas was that other targets, like the destruction of industrial units and the interdiction of railways, had higher priority and more than absorbed the available air effort. That will occur again. The use of air power involves a careful balancing of priorities since one has never enough resources to meet all demands. Nevertheless, in campaigns such as Korea, where industrial complexes and railways are few and far between, interdiction by mining, if possible, would presumably have high priority.

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Perhaps an even more cogent reason why minelaying on land has not been regarded as an air function has been the absence of suitable weapons. The normal bomb dropped from high altitude goes in too far to be set off by movement over it. Yet this technical difficulty is slight compared with others which have been overcome. If the requirement does exist, it can surely be met, provided adequate effort is made to do so.

There seem to be two possibilities worth considering—the use of normal bombs with special fuses and the uses of small bombs with special fuses.

A typical target for minelaying is any focal point on the ground over which traffic would normally pass and which, for topographical reasons, it is difficult to bypass. Obvious targets of this kind are mountain passes, river crossings, roads through swamps, etc.

The use of normal bombs, of, say, 500 lb. weight, fused with varying delay action fuses, would at least provide a deterrent to movement if dropped in sufficient concentrations. A technical snag is that one bomb tends to set off another if they are close together. Even so, it should be possible to have bombs going off at regular intervals within a reasonably small area throughout, say, a period of ten hours, or an average night.

A force of 100 heavy bombers have shown their ability, against railway targets before D Day, to put down very heavy concentrations of 500-lb. bombs on small targets. In those cases, the object being destruction of the target, the bombs were fused to crater. There is no reason why they should not equally be fused with varying delays when the object is not so much destruction of the target but denial of passage over it. 100 heavy bombers each carrying ten tons would put down about 4,000 500-lb. bombs. This would mean an average of six to seven such bombs exploding each minute throughout a ten-hour period within the area bombed, assuming that good delay fuses could be made and that sympathetic detonation did not occur to any great extent. This would seem to provide a reasonable deterrent to night movement on a large scale.

The use of small 10-lb. bombs with special fuses offers much better prospects for interdiction. Dropped in clusters and fitted with retarding tails, their impact velocity can be made such that they will only just penetrate normal ground. They would not, of course, be much good on roads where they would tend to lie on the surface and be easily disposed of. But in combination with heavier bombs, or on ground already bombed, they could be dropped in enormous concentrations and would provide a serious disposal problem. Moreover, a small bomb of this type, whose penetration is so slight, should be capable of fuzing so that it has similar properties to an anti-personnel mine. A force of 100 heavy bombers should be able to carry about 200,000 such bombs and put them down in heavy concentrations more or less where required.

It is not difficult to imagine the delaying effect of this quantity of 10-lb. anti-personnel bombs fused with a combination of variable delays and anti-disturbance fuses in, say, a mountain pass in Korea, or over the areas of a stores park, or throughout the streets of a city.

The breaking of bridges, the destruction of marshalling yards, the mining of river crossings or mountain passes, the patrolling of roads, all have a temporary interdiction value depending on how the enemy is able to deal with them. You cannot postpone movement indefinitely, but interference with it can create bottlenecks which can be exploited in other ways and even delay can prove fatal both to industrial production and to the employment of armies. Air interdiction needs to be developed along every promising line if air power is to fulfil its widest function.

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MARRIED QUARTERS

By Station Master

ON Royal Air Force stations all over the country new married quarters are being built, and the problem of house-hunting thereby solved for at least a few worried officers and their families. This is a great step forward in improving the lot of married officers in the Royal Air Force, and that refers to over 80 per cent. of the total number of officers in the Service today.

Not only is the policy of building many more quarters a welcome sign, but also the design of the new buildings reveals a real attempt to keep pace with the times. The new little Group VI (Type V) quarters may often be sited in unattractive surroundings, and the houses are certainly built so close together that no more privacy can be expected than in a suburban area near London, but what a joy it is to be provided with a sensibly and attractively laid out and modernly equipped new house. Here at last is a building designed to be run by the occupants. Obviously "the penny has dropped" and the powers-that-be realize that it is no longer necessary to ignore those ugly rumours that officers have been known not only to clean their own buttons and shoes but also to help with the housework, and that wives do spend a great part of the day in the kitchen. Never again, let it be hoped, will a Group Captain be provided with a seven-bedroomed house designed to have three living-in staff to run it. Such was the short-sighted design of Group II quarter in 1934.

Yes, conditions are much better, and a wave of enthusiasm and relief can be sensed throughout the Service. Wives are no longer just grateful to live in an Air Ministry quarter; they are now proud of their compact, modern house. Larger buildings are on their way. Types IV and III, offering four bedrooms instead of three, a study, and a second bathroom. No longer the impossibility of getting the whole house warm in winter, no more descending into the dungeon of a furnace-room to wrestle with a ravenous monster that devours more than you have and produces less than you need. Neat little electric radiators adorn all parts of the house, and there are alternative methods of water-heating, coke stove in the kitchen or electric immersion heater in the linen cupboard.

But let us pause a moment in this mood of exultation, and ponder whether keeping up with the times is enough. Ought we not to aim at being ahead of the times? Are we right to build up little villages of married quarters on all our stations, knowing as we do that flexibility is the prime quality of air forces? Would it not be better to go in for blocks of flats—tenement buildings if you wish to apply that rather disparaging name? My all means keep a few separate houses for the more senior officers, but avoid building up new colonies of little houses.

There will undoubtedly be objections raised to this suggestion on the grounds of lack of privacy, inconvenience for perambulators, unsightliness, and so on, but there are many advantages in compensation. After all, the biggest problems in a household nowadays are heating and domestic help. I have already mentioned that it is possible to keep one of the new Type V quarters warm, but that of course depends on whether you are prepared to meet the resulting fuel bills. In some of the older quarters it was not even possible to keep warm, however much you spent. As regards domestic help, it is true that the new houses make life more bearable, but why should we accept the principle that officers' wives

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are to be permanently tied to domestic chores, even if the surroundings are congenial. The more quarters there are on a station the greater the need for social life which allows wives to become part of the station and so help it to be an active and contented community. A collection of flats in a single building would surely go far towards solving both these problems. Central heating for the whole building would be provided from an installation in the basement, or externally, and tended by established civilian labour, so that the only responsibility of the tenants would be to pay a proportion of the cost of the fuel on their rent bill, certainly less than in the case of an individual house. Domestic help will always remain a difficulty, but at least the knotty problem of how a squadron leader in married quarters is to use his entitlement of one-third of a batman could be solved. In the block of flats, as in a Mess, there would be a pool of batmen under a N.C.O., established on the normal basis, and able to cater for the "batting" requirements of all the officers in the building.

Other advantages, from the Service angle, spring to mind. Each large block could have its resident Barrack Warden, who, being permanently on the spot, could exercise satisfactory supervision over Air Ministry property, a state of affairs which it is becoming increasingly difficult to ensure with the growing numbers of quarters. The provision of service telephones would be simplified, only one extension per floor being essential, aided by a house telephone connecting all flats to the hall porter's office. A hall porter, too, a central figure around whom the life of the building would certainly revolve—parcels left, messages sent and received, and so on. He would be one of the staff established for the maintenance of the public parts of the building.

Turning once again to the interests of the tenants, there is the question of gardens. Most officers enjoy a garden, but few work to improve their plot, or even to keep it at the standard at which they find it. The block of flats would have a communal garden laid out as part of the station grounds, and maintained as such. Garages, too, could be provided for the tenants, in the basement. To plan farther, rooms for the use of a Married Families' Club should be included, where meals could be obtained and meetings held.

So much for the advantages under normal conditions. As a fighting service we do not expect to live under normal conditions all the time. The evacuation of married quarters during the last war produced extra accommodation for increased war establishments, but not in a very convenient form. Blocks of flats would lend themselves much more readily to the varying needs of war-time —extra single officers' rooms, office accommodation, lecture rooms, etc. The basement garages would automatically become the air-raid shelters.

In answer to possible critics who may regard the whole scheme as abhorrent, I would say that the fact remains that until something, preferably peaceful, happens to decrease the population of the British Isles there will be a shortage of housing, and the simplest and cheapest way of combating this shortage is to build one roof over as many dwellings as possible. Since this at the same time produces a more flexible accommodation plan on stations the wisdom of the policy is further endorsed. Action has already been taken by at least one unit to get this idea accepted, but without success. The purpose of this article is to promote further thought on the subject.

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LETTERS TO THE EDITOR

DEAR SIR,

I feel that future operations against enemy forces will require the fuller participation of air power. Tactical movement of sea and land forces will be impossible without a fully integrated air-support force.

As the terms land/air and sea/air co-operation become part of our Service vocabulary, so the fact emerges that the air is the common denominator. The naval and military interest is, for the most part, uni-partite. The onus of ensuring efficient cohesion of our Fighting Services rests upon the Royal Air Force. Now is the time for the Royal Air Force to take the lead in devising joint-Service training and liaison. Officers of all Services must be trained in matters common to each arm. Air Force officers must be more fully trained in matters appertaining to land and sea.

Now is not the time to discuss in detail the fields of warfare to be considered. Naval and military strategy and tactics involving air support and co-operation, logistic and administrative problems are but a few that will have to be faced.

Immediate steps should be taken to provide a nucleus of Air Force officers fully trained in the ways of the other Services. Training should be practical, where possible, and should include a greater number of Inter-Service attachments than is the present case. The attachments should be long enough to ensure experience of actual command positions. On cessation of this training an examination should be set by the arm concerned which would be recognized by the three Services. It would be essential to devise a badge or device which would be readily identified by all and would ensure joint recognition. The distinguishing badges would be worn by all allied forces. Joint-Service authority would be limited in all save actual commander position to that of a junior officer; this would be so that senior officers of one Service would not be given disproportionate authority and responsibility to the remainder. Thus it would be possible for, say, a Wing Commander to issue commands to all combined personnel at sub-lieutenant or subaltern level. Joint recognition on a reciprocal basis must be made.

Joint administration in many cases is even now a necessity. All movements staffs, medical and dental personnel, chaplains, permanent staffs of troopships and Service policemen would all benefit by being put on a common basis. In the case of non-commissioned ranks, recognition would be made as for officers, joint recognition would be on an agreed level at, say, junior N.C.O. status only.

An experimental unit should be formed where all personnel could be trained on a joint-recognition basis. This unit could be small and would be used at first to form a nucleus for a combined-operation body and would be permanently ready for the grafting on of a far larger number of personnel. Apart from the advantages to be gained by laying down joint-training schemes there would exist the moral and psychological base, upon which the paints of the artist commander could be liberally daubed, without the danger of the colours running.

As a first step to an integrated force let there be joint training and joint recognition. Regulations and administration of the forces under survey, our own and those of our allies, must be observed upon by standing committees and the highest common factor be incorporated in Joint-Service publications. These manuals will at first be comparatively slender but will contain the beginnings of what will become essential regulations when joint administration of large numbers of our allied forces becomes a reality. As the forms and regulations are given joint recognition they will be overstamped Joint-Service or Joint-Allied. The

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organization could be based on that of the Inter-Service Committee on Standardization of Cataloguing of Stores.

The citizens of western civilization look to the air for their protection. The Royal Air Force must provide the lead so that our Fighting Services will not be handicapped in any future joint effort in the defence of our home lands.

There is no doubt in my mind that the air will be a common factor of future warfare; the Royal Air Force must go forward to assist the other Services; to wait until assistance is requested may prove too late.

Your obedient servant,

FLYING OFFICER P. A. TUNBRIDGE.

DEAR SIR,

As one who has previously suggested in your pages* the need for "a closer association of the technical and supply branches of the R.A.F." may I welcome the comprehensive article on this subject by "Korax" in your April number.

It is not possible within the compass of a letter to consider in detail the implications of the scheme proposed, but as a fellow-believer may I offer three suggestions; the first, a triviality, the others more fundamental:

(i) En passant may I record a plea for the English as against the foreign, the three-syllabled against the four, the familiar against the unknown, the pronounceable against the unpronounceable—in brief, for "Maintenance" instead of "Matériel." "Matériel," however defined, is essentially matter, and completely excludes the advisory and functional aspects of technical support. Moreover, it is unable to form either adjective or verb: a considerable disadvantage for service use.

(ii) So interlinked are the functions of the "Maintenance" complex, and so necessary is it from considerations of development, utilization, and servicing to consider so complicated a mechanism as an aircraft as an entity, that it is unlikely that the division of the staff organization into "sections . . . responsible for specific ranges of equipment"—in essence a supply conception—is the best that can be devised for the new branch. Specialist Directorates there must undoubtedly be, but it would seem that at least half the staff should be organized functionally. Once this principle is conceded the place of research, development and movements in the organization becomes clear.

(iii) As "Korax" has indicated, this branch could only succeed in proportion to the quality of the men that it would attract. Rightly he has stressed that many of the entry should be from our public schools and universities. But is the proposed organization really wide enough in scope to attract the best?

Fortuitously the contiguous article outlines a plea by Wing Commander K. R. C. Slater, O.B.E., A.F.C., for a "common air list." While not supporting in detail his proposal, has it not in essence the solution to this problem? The common gradation list for technical and supply officers in the middle ranks might well be parallel by a common gradation list for "Maintenance" and "G.D." officers of "Air rank." Thus might we obtain that flexibility which the ever-changing pattern of operational, technical, and logistic requirements demands.

As Wing Commander Slater and "Korax" have so rightly said: "The best are only just good enough" and "Unity is strength."

Yours faithfully,

SQUADRON LEADER C. T. NANCE.

* R.A.F. Quarterly, January, 1950, p. 28.

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CURRENT EVENTS

[Air Ministry Photo

Parade (W.R.A.F. contingent)—Presentation of His Majesty The King's Colour to R.A.F., with jet fighters flying past

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The King's Chapel, Gibraltar, during the service for the unveiling and dedication of the Badges of the Squadrons of the R.A.F. and Commonwealth Air Forces which fought from Gibraltar during the Second World War

A Memorial to Gibraltar's Air Defence—Second World War

To commemorate the gallantry and fortitude of the officers and airmen of the squadrons of the Royal Air Force and Commonwealth Air Forces who fought from Gibraltar during the Second World War, the badges of these squadrons have been placed in the King's Chapel at Gibraltar. Early in the year a special service was held in this chapel for the unveiling and dedication of these badges.

After the first part of the service, conducted by the Chaplain, had concluded, His Excellency the Governor of Gibraltar, General Sir Kenneth Anderson, K.C.B., M.C., accompanied by the Air Officer Commanding, proceeded to the sanctuary entrance where, at the request of the Air Officer Commanding, His Excellency unveiled the badges on the east wall to the right and left of the altar:

"To the Glory of God, and to commemorate that they fought from this fortress during the War, 1939-45, I unveil the badges of:

"_____*

"48 Squadron, Royal Air Force.
"179 Squadron, Royal Air Force.
"202 Squadron, Royal Air Force.

*The badge of 22 Squadron, South African Air Force, is being added later. The plaque (temporarily placed in the north transept) and the badge of 202 Squadron, Royal Air Force, will then be placed on the west wall of the north transept.

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"233 Squadron, Royal Air Force.
"500 Squadron, Royal Air Force,
"520 Squadron, Royal Air Force,
"608 Squadron, Royal Air Force,
"458 Squadron, Royal Australian Air Force."

The Station Chaplain, Royal Air Force, then proceeded to dedicate the badges:

"To the Glory of God we dedicate these badges of loyal service and sacrifice. In the name of the Father, and of the Son, and of the Holy Ghost. Amen.

"May all who here behold these badges and do honour to the officers and airmen of the squadrons we now commemorate, be so filled with the spirit of their service and fortitude that they may live to the Glory of God in faithful service; through Jesus Christ, Our Lord. Amen."

The badges in this chapel will be a lasting memorial to the part played by these squadrons in the Second World War whilst operating from this British fortress.

Battle of Britain Week

This year the Battle of Britain Week will be from 10th to 16th September, certain R.A.F. stations being "At Home" on Battle of Britain Day, Saturday, 15th September, 1951.

Last year, from car-park receipts, collections on airfields, sale of programmes, etc., £13,600 was raised for R.A.F. charities. This sum was divided equally between the R.A.F. Benevolent Fund and the Royal Air Forces Association.

Halton Memorial to Monsignor H. Beauchamp

A baptismal font has been placed in the Catholic Church at R.A.F. Station, Halton, Bucks, as part of a memorial to the late Rt. Rev. Monsignor H. Beauchamp, C.B.E., M.C., former Principal Chaplain (R.C.) of the Royal Air Force, who was a chaplain at Halton from 1919 to 1939.

The font, of Sicilian marble on a Siena marble base, stands in a handsomely furnished baptistry which is part of the memorial, and from the funds available the memorial committee has also presented a chalice, monstrance and ciborium for use in the church. The three sacred vessels are of solid silver, fire-gilt, and bear a memorial inscription. The chalice, 7¾ inches high and weighing 27½ ounces, is a replica of a sixteenth-century chalice in the Victoria and Albert Museum, London. The monstrance, 20½ inches high and weighing 65 ounces, is Gothic in style, and the ciborium, with base and stem a replica of the chalice, weighs 32 ounces and is 10¼ inches high.

As it was particularly desired to commemorate Monsignor Beauchamp's association with the Aircraft Apprentices' School at Halton, the memorial committee has set aside a sum of money to provide a book prize, known as the Monsignor Beauchamp Prize, for award on the recommendation of the Commandant to the best all-round apprentice at each passing-out parade.

Presentation of H.M. The King's Colour to the R.A.F.

Recently, at a parade of 2,500 officers, airmen and airwomen in Hyde Park, H.R.H. Princess Elizabeth presented H.M. The King's Colour to the Royal Air Force.

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[Air Ministry Photo

The service at the Presentation of H.M. The King's Colour. Behind H.R.H. The Princess Elizabeth is Air Chief Marshal The Hon. Sir Ralph Cochrane, G.B.E., K.C.B., A.F.C., A.D.C. Facing the Princess is the Reverend Canon L. Wright, K.H.C., Chaplain-in-Chief, Royal Air Force, and on his left the Reverend F. B. Morley, B.D., K.H.C.

[Air Ministry Photo

H.R.H. The Princess Elizabeth passing one of the many representative squadrons during her tour of inspection of the parade in a jeep

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It was an impressive ceremony and the steadiness on parade and precision of drill movements of those representing the Royal Air Force was worthy of the fine Service they had the honour to represent. The massed bands of the R.A.F. and the fly-past of 100 Meteor and Vampire jet fighters, despite the adverse weather conditions, upheld the high standard set by the Air Force on previous ceremonial occasions. The people of London have ever had a warm affection for the R.A.F., and they turned out in their thousands to witness this ceremony; rain or no rain, they were not going to miss an occasion they had been eagerly looking forward to.

Sometimes in the solemnity and pageantry of the consecration and presentation of Colours to a regiment, unit or Service, the actual significance of the Colours is forgotten. From the earliest days of the standard-bearers of the Roman Legions until the present day its purpose has remained the same, even though a wider sense is now given to that purpose, on account of the changes that have occurred in the methods of waging war. When Colours were taken into battle they were the rallying point and ever an inspiration to greater efforts. Only when physically incapable of striking a further blow in their defence were Colours allowed to fall into the hands of the enemy; even at this stage many artifices were used to prevent this final tragedy.

H.M. The King's Colour, symbolic of what we fight for, will be honoured and jealously guarded to the same high degree as Standards and Colours of past ages. The knowledge of its existence will always remind the Royal Air Force of the traditions built by the daring, efficiency and sacrifice of their predecessors, whose unforgettable service made the R.A.F. what it is today—an Air Force second to none. Hitherto it has been this country's sure shield when attacked and the spearhead of our victories over our enemies. It must ever remain so.

R.A.F. Physical Training Team at South Bank

The R.A.F. Physical Training team will give twenty-four demonstrations of gymnastics and exercises calling for great physical strength at the South Bank Exhibition during the next few months. Four displays, two in the morning, two in the afternoon, will be given on these days: 16th and 27th July, 15th and 16th August and 7th September. Visitors to the South Bank on 8th and 18th May and 28th June have already seen the team in action.

The team consists of forty airmen who have been trained at the R.A.F. School of Physical Training at Cosford, Staffs, and the display, which lasts about thirty minutes, includes gymnastics and very strong exercises with 100-lb. logs. The team is one of two—the other consisting of members of the W.R.A.F.—which have been formed to give demonstrations of the R.A.F.'s physical training methods. In addition to its engagements at South Bank it will take part in about twenty-five other events in the South of England during the summer.

Married Quarters for the R.A.F.

A programme of 4,000 additional married quarters for the Royal Air Force stations in the United Kingdom has been included in the Air Estimates for 1951-52. A similar number are in course of construction and are expected to be completed within the next financial year, which began in April.

Overseas an additional 440 married quarters will be put in hand. Others are in progress and it is anticipated that 600 will be completed within the next year.

During the present financial year approximately 1,750 new permanent married quarters will have been completed at home stations and about 300 at overseas stations.

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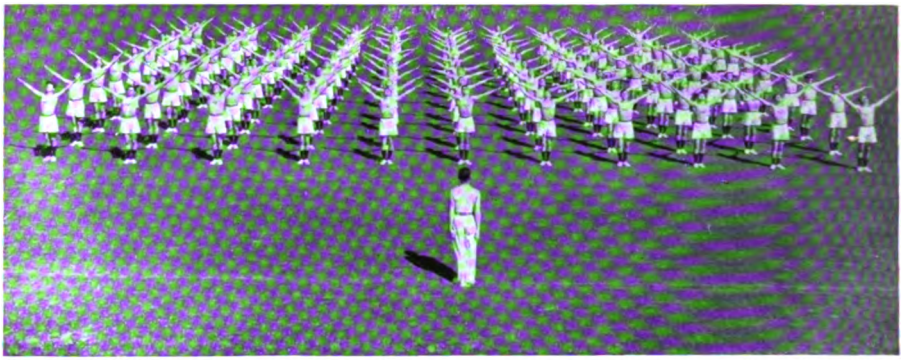


[Air Ministry Photo

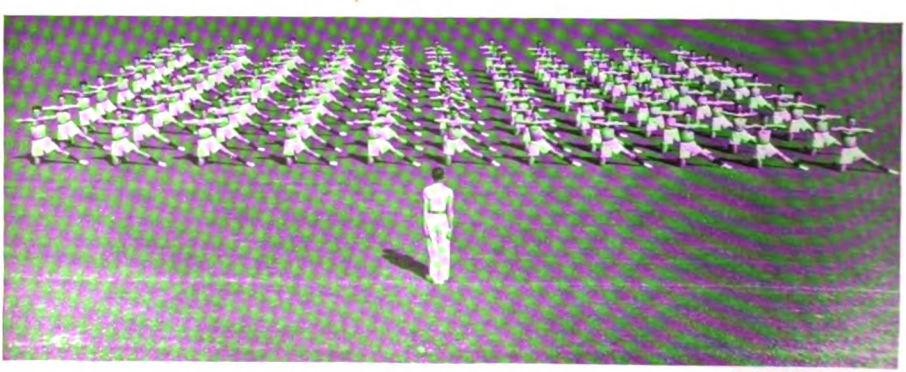
The R.A.F. Physical Training Team for the Royal Tournament. A final rehearsal before proceeding to Olympia

The Royal Tournament

At this year's Royal Tournament the Royal Air Force repeated two of the events which were so popular with those who attended Olympia in 1950. A physical training team of 128 Royal Air Force National Service recruits, dressed in Air Force blue singlets ornamented with the Air Force eagle in dark blue, white shorts, red belts, blue stockings with light blue tops and white shoes, gave a programme of free standing exercises, without a word of command, to music played by the R.A.F. Central Band.

The R.A.F. have ever received the highest praise for their physical training displays, and this year's performers maintained the same high standard; attained only by the excellence of the instruction over a short period prior to the Royal Tournament by a team of Regular instructors of the R.A.F. The precision with which they marched into the arena in eights, counter-marched and opened out into formation and carried out their physical exercises showed, from the perfect uniformity and timing, that every recruit was doing his utmost for his side—the R.A.F.

The twelve-minute display concluded with a maze-march done at the double. The task of perfect co-ordination of 128 airmen in this finale was no easy one, but they acquitted themselves most creditably.



[Air Ministry Photo

Another exercise by the recently enlisted National Service men who formed this R.A.F. representative team for a physical training display at the Royal Tournament, 1951

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The second event, a recent addition to these Royal Tournaments, that of a performance by police dogs of the R.A.F., was again a wonderful demonstration of animal training. Obedience to their handlers is one of the most important qualities in these Alsatian dogs and one by which spectators were able to measure the efficiency of their R.A.F. training. This quality was impressively demonstrated in a scene in the arena when a would-be thief was tampering with a "jeep." An R.A.F. policeman entered with his Alsatian and released him at some distance from the thief. The dog rushed to the attack, but on the point of closing with his quarry halted abruptly at a command from his handler. The Alsatian's implicit obedience to his master was the only sure safeguard the threatened man had against being savaged, for in this performance he was wearing no protective clothing.

Other obedience tests included marching and counter-marching and a fine display of jumping. The thirty R.A.F. Police Alsatian dogs which were trained for this particular programme are valued at not less than £3,000.

The Alsatians which took part have been engaged on guard and security duties on R.A.F. airfields and maintenance units in Great Britain. Working as a team with members of the R.A.F. Police they have proved themselves one of the most effective means of ensuring protection against theft. Even in complete darkness and deafened by noise, the R.A.F. trained dog can scent and locate hidden intruders.

The number of these Alsatians in the R.A.F. (they have Service records and their own scale of rank) has been steadily increasing since they were first used by the Service early in the last war. Apart from 164 at the Netheravon training school, there are 216 dogs on duty in this country, sixty-five in Germany, seventy with Middle East Air Force units and sixty-eight in the Far East. A number of these dogs are being used with great success to assist the civil police in Malaya against Communist insurgents. So far they have been responsible for the capture of about fifty bandits, whose comrades are now taking great care not to ambush patrols led by R.A.F. Police dogs.

The R.A.F. Dinner Club

The annual dinner of the Royal Air Force Dinner Club was held on 30th March, 1951, at the Park Lane Hotel, and was attended by past and present members of the Royal Air Force. After dinner, when seclusion was assured and no fear of any startling cry arising of "I spy a stranger in the House," Marshal of the Royal Air Force Sir John C. Slessor, G.C.B., D.S.O., M.C., immediately gained the closest attention of the 200 senior officers present, who had been impatiently waiting for the usual "off-the-record speech" by the Chief of the Air Staff.

His speech was not only enlightening but encouraging, and made all realize the efforts being made to maintain the high standard of efficiency that is essential in our first line of defence and the heavy load that must be borne by those responsible for its readiness to face any eventualities.

From among the "Founders of the R.A.F." at the top table were Marshal of the Royal Air Force Sir John M. Salmond, G.C.B., C.M.G., C.V.O., D.S.O., D.C.L., LL.D.; Marshal of the Royal Air Force Sir Edward L. Ellington, G.C.B., C.M.G., C.B.E.; Marshal of the Royal Air Force The Lord Newall, G.C.B., O.M., G.C.M.G., C.B.E., A.M.; Air Chief Marshal Sir Frederick W. Bowhill, G.B.E., K.C.B., C.M.G., D.S.O.; Air Chief Marshal Sir John M. Steel, G.C.B., K.B.E., C.M.G.; and in addition to the present Chief of the Air Staff, among the

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present-day builders of the Royal Air Force were noticed Air Chief Marshal The Hon. Sir Ralph A. Cochrane, G.B.E., K.C.B., A.F.C.; Air Chief Marshal Sir William F. Dickson, K.B.E., C.B., D.S.O., A.F.C.; Air Chief Marshal Sir Leslie N. Hollinghurst, K.C.B., K.B.E., D.F.C. We all missed with regret one known to every member of the R.A.F. Dinner Club, the "Father of the Royal Air Force," Lord Trenchard.

Royal Flying Corps and Royal Naval Air Service Reunion

Another dinner which recently took place was a reunion of the pioneers of Service aviation at the Dorchester Hotel. The many familiar faces immediately brought back reminiscences of those early days, and "fishing yarns" had nothing on some of the anecdotes recounted as the evening wore on and good company and excellent refreshment mellowed the assembled company.

Two of the most well-known representatives of the military and naval wings, the former well-known figure of "Boom" (Lord Trenchard) and the latter representative, Admiral Sir Murray Sueter, were missing on this occasion.

The speeches after dinner were in the capable hands of Air Chief Marshal Sir Phillip Joubert and Vice-Admiral Bell Davies, V.C., and they both ably deputized for the missing champions of the R.F.C. and R.N.A.S.

This is an important and enjoyable reunion and it is to be hoped that it will be maintained as an annual affair. The gathering was honoured by the presence of the present Chief of the Air Staff, Marshal of the Royal Air Force Sir John Slessor, who, better than anyone else present, would be in a position to judge the amazing progress made in aviation since his early days in the Royal Flying Corps.

At this dinner and that of the R.A.F. Dinner Club it seemed a pity that old friends should meet for so short a time and drift apart again. This is mainly apathy, that regrettable state we all drift into on leaving the Service. This, despite the fact that our greatest enjoyment in retirement are the reminiscences of the "good old days."

Expansion of R.A.F. Pilot Training in Rhodesia

The training of Royal Air Force pilots in Southern Rhodesia is being expanded and a reorganization in the Rhodesian Air Training Group, providing two pilot training schools instead of one, is now in progress. Since the Rhodesian Air Training Group was revived after an eighteen-month lapse, in 1947, there have been two training schools in Rhodesia, one for pilots at Heany, and the other for navigators at Thornhill. The training of navigators in Rhodesia is to cease and both schools are to train pilots only.

The first pilots' course began at Thornhill in January and the second in March, and by mid-September Thornhill will be handling its optimum number of five courses. The last navigators' course at Thornhill will pass out on 1st October, a month before the completion of the first pilots' course, and by that time nearly 300 navigators will have been trained there since 1947.

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SPORT IN THE R.A.F.

LAWN TENNIS

THE Royal Air Force and Women's Royal Air Force Individual Lawn Tennis Championships will be held from 30th July to 4th August, 1951, at the All England Lawn Tennis Club, Wimbledon, and the Inter-Services Lawn Tennis Championships will be held there on 6th and 7th August, 1951.

Royal Air Force and Women's Royal Air Force inter-station cup competitions and inter-command competitions are progressing and it is hoped to include the final results in our next number of the R.A.F. QUARTERLY (October issue).

GLIDING ASSOCIATION'S EXPEDITION TO FRANCE

A Royal Air Force Gliding and Soaring Association party recently visited St. Auban, in the French Lower Alps, where it carried out an investigation into standing waves. The leader was Group Captain G. J. C. Paul, D.F.C., Chairman of the Association, and the party also included Wing Commander W. H. Ingle, A.F.C., of R.A.F. Station, Heslington, York, and Squadron Leader A. R. Williams, of the Air Ministry.

The objects of the visit, in which the Director of the Meteorological Office interested himself, were to do as much flying as possible in the famous standing wave at St. Auban, and to study French methods of research into the wave. The expedition was, in fact, a pointer to the rapidly-growing interest in the mechanics of standing waves, as yet only imperfectly understood.

The R.A.F. party took its own high-performance glider, a Weihe equipped with electrically operated blind-flying instruments and oxygen.

Unfortunately, only one full wave occurred during the visit, but the party carried out thirty-five hours' flying and heights of up to 17,000 feet were reached, including a certain amount of flying in fairly turbulent air. Many interesting aspects of gliding were studied, such as a funnel shaped valley which deflected the wind upward in such a way that it was possible for the Weihe to remain at 6,500 feet for three hours, although there were no thermals and the nearest hill was several miles away.

On the day before the party arrived the Chief Pilot of St. Auban and the holder of the present French altitude record both reached 26,000 feet in a wave. After getting into the wave—a difficult process—their rate of climb was 39 feet per second, dropping evenly to zero as the top of the wave was reached.

The French technique of wave flying was studied in detail, and much meteorological information on waves was obtained from the French meteorological officers stationed at St. Auban. These two officers, like all the French flying personnel with whom the party came into contact, were most helpful and made available all their records and files.

What the party learned in France has put the standing waves of the Pennine Chain, the Lake District and Scotland into a new light. There is nothing peculiar to the St. Auban situation which is not also present in many parts of the United Kingdom. The U.K. standing waves, if properly used, can produce spectacular heights equal to those obtained in France, and the R.A.F.G.S.A., fortified by its experiences at St. Auban, intends to continue its research as far as funds allow this summer and next winter over Northern England and Scotland.

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VICTORY ROLL

R.A.F. College, Cranwell, easy after beating York Area in the final of the Clinker Fours

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R.A.F. ROWING CLUB REGATTA, 1951

THE fifth annual regatta of the R.A.F. Rowing Club took place at Reading on Saturday, 12th May, 1951. The races were held over the second half-mile of the Reading Amateur Regatta Course on the Caversham reach, and the programme of thirty-four races began at 11.30 a.m. The weather was ideal for both spectators and oarsmen, and a slight following wind ensured fast times.

Air Marshal Livingston, President of the R.A.F. Rowing Club since its foundation, umpired the finals, and Lady Livingston presented the prizes. The club were honoured by the attendance of Lord and Lady Tedder, and other distinguished guests included Air Chief Marshal Hollinghurst (Air Member for Personnel); Air Marshal Foster (Air Officer Commanding-in-Chief, Home Command); Air Vice-Marshal Hardman (Commandant of the R.A.F. Staff College); and Air Commodore Bell (Air Officer Commanding No. 90 Group). Old members were very pleased to welcome back to the river, after two years' enforced absence due to illness, Wing Commander K. V. Garside, captain of the R.A.F. crew which reached the final of the Thames Cup at Henley in 1948.

Despite the severe handicap imposed on training for the regatta by appalling winter and spring weather, with frequent recurring floods, forty-one entries were received and competitors came from twenty different stations. During the winter, as an experiment, an attempt was made to get Air Force rowing organized on an "area" basis to help people on stations where there were no facilities or where only small numbers were interested. It was encouraging to note that several "area" crews appeared in the regatta, one of which reached the final of the Clinker Fours.

The honour of the day went to R.A.F. Station, Benson, who won all the events except one, and so, for the second year in succession, won the Scott Paine Trophy, awarded to the station putting up the best performance in the regatta.

The results were as follows:

Coxswainless Fours (Senior Fours Cup).—1, R.A.F., Benson (bow, steers, Aircraftman Clarke; No. 2, Aircraftman Dainton; No. 3, Flying Officer Andrews; stroke, Flight Lieutenant Stewart); 2, Fighter Command (bow, steers, Squadron Leader Procter; No. 2, Flying Officer Masser; No. 3, Wing Commander Huxley; stroke, Leading Aircraftman Hall). Distance: 3 lengths; time: 2 min. 40 sec.

Clinker Fours (Lullebrook Cup).—1, R.A.F. College, Cranwell (bow, Flight Cadet Cornish; No. 2, Flight Cadet Bowyer; No. 3, Flight Cadet Calvert; stroke, Flight Cadet Legge; cox, Flight Cadet Hucker); 2, York Area (bow, Flying Officer Burke; No. 2, Sergeant Swanson; No. 3, Engineer Cadet Spencer; stroke, Sergeant Titchener; cox, Squadron Leader Howells). Distance: 2¼ lengths; time: 2 min. 49 sec.

Tub Fours (Embling Cup).—1, R.A.F., Benson "A" (bow, Aircraftman Milledge, No. 2, Aircraftman Facy; No. 3, Senior Aircraftman Pavelin; stroke, Senior Aircraftman Walker; cox, Junior Technician Savory); 2, H.Q., No. 90 Group (bow, Aircraftman Paker; No. 2, Aircraftman Parks; No. 3, Aircraftman White; stroke, Flight Lieutenant Jordan; cox, A. N. Other). Distance: 1½ lengths; time: 3 min. 2 sec.

Pairs (Brady Bowl).—1, Flying Officer Andrews (bow, steers) and Flight Lieutenant Stewart (stroke), Benson; 2, Squadron Leader Procter (bow, steers), Old Sarum, and Flying Officer Grossart (stroke), C.M.E. Distance: 3¼ lengths; time: 3 min. 2 sec.

Senior Sculls (Senior Sculls Cup).— 1, Aircraftman Dainton (Benson); 2, Flying Officer Andrews (Benson). Distance: 2¼ lengths; time: 2 min. 37 sec. (shortened course).

Clinker Sculls (Clinker Sculls Cup).—1, Aircraftman Facy (Benson); 2, Flight Cadet McCormack (Cranwell). Distance: 3 lengths; time: 3 min. 18 sec.

Novice Sculls (Cookham Sculling Cup).—1, Leading Aircraftman Spurway (Benson); 2, Leading Aircraftman Appleyard (Medmenham). Easily. Time: 3 min. 27 sec.

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R.A.F. ROWING TRIALS, 1951

On Sunday, 13th May, final trials were held at Reading to select crews to represent the Royal Air Force at Henley Royal Regatta this year. The following crews were selected:

Thames Cup.—Bow, Pilot Officer Clarke (Stradishall); No. 2, Aircraftman D. F. Dainton (Benson); No. 3, Squadron Leader F. D. Procter (Old Sarum); No. 4, Flying Officer J. S. Masser (H.Q., F.C.); No. 5, Sergeant R. C. Simpson (Marham); No. 6, Aircraftman B. F. Lock (Halton); No. 7, Aircraftman J. M. Clark (Benson); stroke, Leading Aircraftman N. A. Hall (H.Q., F.C.); cox, Leading Aircraftman Rooke (Wellesbourne Mountford).

Wyfold Cup.—Bow, steers, Flying Officer T. Burke (Driffield); No. 2, Flying Officer K. Grossart (C.M.E.); No. 3, Aircraftman D. Rickard (3604 F.C.U.); stroke, Squadron Leader J. H. R. Lewis (Hucknall).

Squadron Leader Procter was appointed captain.

The Thames Cup Eight rowed their boat up to Henley from Putney and both crews started intensive training on the Henley reach at the beginning of June.

R.A.F. BEAGLING ASSOCIATION FORMED

It was recently announced that the first pack of the R.A.F. Beagling Association was being formed at Cranwell, and if there is sufficient demand other packs will be started in districts where hunting can be undertaken. Group Captain L. G. Levis and Flying Officer R. J. C. Stewart, both of No. 3 Initial Training School, Royal Air Force, Cranwell, are the chairman and honorary secretary and treasurer respectively.

Beagling used to be an outstanding feature of Cranwell life, and its revival is a welcome sign of the College returning to activities which many of us enjoyed in the "bad old days" before the war. When H. C. Pyper was master of the beagles, it may be remembered that "the sound of his horn brought us from our beds" sometimes on occasions when beagling would have presented difficulties —firstly because a run in the middle of the night presents innumerable hazards; secondly after a "Guest Night" one does not feel disposed to take such violent exercise, and, lastly, both the beagles and "Harvey" would have taken a dim view of such proceedings.

I.S.B.A. CHAMPIONSHIPS

Once again the R.A.F. staged the championship bouts for the Imperial Services Boxing Association. Again, with the kind permission of Group Captain C. M. Drew, C.B.E., they took place at R.A.F. Station, Hullavington. As last year, the organization was extremely well done, but sad to relate the winners were not the R.A.F. but the Army.

Presentation of the prizes was made by this year's President of the I.S.B.A., Vice-Admiral A. C. G. Madden, C.B., C.B.E., Second Sea Lord, who, in his remarks, paid a tribute to the way in which arrangements for the bouts had been made by the R.A.F.

Some good fights were seen, but the general feeling was they were not up to the standard reached last year.

Winners.—Fly-weight: A.B. Weliwitigoda (Navy). Bantam-weight: A./C. Nicholls (R.A.F.). Feather-weight: A. C. Lewis (R.A.F.). Light-weight: A./C. Wallis (R.A.F.). Light Welter-weight: L./Cpl. Drummond (Army). Welter-weight: Sigmn. Biard (Army). Light Middle-weight: L./Sergt. Roberts (Army). Middle-weight: L./Cpl. Ludlam (Army). Light Heavy-weight: Cpl. Crooks (Army). Heavy-weight: Cpl. Worrall (Army).

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R.A.F. MAY GO BIG GAME HUNTING

A Safari Club formed at R.A.F. Station, Eastleigh, near Nairobi, is hoping eventually to be able to organize expeditions into the African bush in search of big game.

The club is limited for a trial period to a membership of twelve and aims to give airmen a chance to see Africa's wild life, native communities and equatorial landscape at reasonable cost. Under the leadership of Squadron Leader E. J. Harrod, D.F.C., the members will study and train themselves to provide expert advice and guidance to other members of the Middle East Air Force who may wish to use Eastleigh as a safari leave-centre.

At first, only week-end sight-seeing and photographic safaris within a hundred miles' radius of Nairobi will be attempted. Later, when members have gained experience, longer expeditions and big game shoots will be organized.

Members will be given lectures by visiting sportsmen and will see the Kenya Game Department film shows as part of their training.

LAND-YACHTING BY R.A.F. IN RHODESIA

The popularity of land-yachting is increasing yearly in the R.A.F. Pioneer of this sport, No. 4 Flying Training School established the first desert land yacht club on the sands flanking the Suez Canal and now continues it at R.A.F. Station Heany as a unit of the Rhodesian Air Training Group. There are similar clubs at R.A.F. stations in the Persian Gulf and another is to be formed in the Suez Canal zone.

In Egypt, No. 4 Flying Training School possessed thirty yachts, which ventured out over the desert on week-long expeditions—often as far afield as Cairo. In Rhodesia the school's enthusiasts only have two yachts in use. Another yacht is being built and soon the club will have a fleet of six yachts, together with a number of miscellaneous craft, designed, built and owned by club members themselves.

As soon as flying finishes, and before night-flying starts, the land-yachts are brought out and race up and down the perimeter track at speeds approaching fifty miles an hour. Timesmen, stop-watches in hand, record speeds on the mile-long upward and downward legs. Fast speeds have been reached on downwind runs and one yacht recently topped 73 miles an hour.

Each of the club's two yachts is valued at £50. Made by officers, trainee pilots and airmen club members, the two yachts bear little resemblance to each other. A salvaged Harvard fuselage is the skeleton of one craft, with the same plane's tailwheel doing duty as the land-yacht's helmwheel and its ample waist supported by a Tiger Moth's undercarriage wheels. Bermuda-rigged, its 24 ft. by 12 ft. mainsail and 24 ft. by 6 ft. jib came from firing drogues, their bullet punctures carefully mended. The other, similarly made, is Gunther-rigged. A third land yacht, now well past the drawing-board stage, will be all metal in construction.

The growth of R.A.F. interest in land-yachting is shown by the fact that a home station, Manby, in Lincolnshire, is now studying a blueprint of one of the Heany yachts with a view to reproducing it, and moves are afoot for official recognition of land-yachting as a R.A.F. sport.

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CONCERNING PERSONNEL

H.M. THE KING'S BIRTHDAY HONOURS LIST

K.C.B. (MIL.)

Air Chief Marshal Sir George C. Pirie, K.B.E., C.B., M.C., D.F.C., LL.D.
Air Chief Marshal Sir Hugh P. Lloyd, K.B.E., C.B., M.C., D.F.C.
Air Chief Marshal Sir William Elliot, K.B.E., C.B., D.F.C.

C.B. (MIL.)

Air Vice-Marshal S. D. Macdonald, C.B.E., D.F.C.
Air Vice-Marshal N. H. D'Aeth, C.B.E.
Air Vice-Marshal T. G. Bowler, C.B.E.
Air Commodore A. McKee, C.B.E., D.S.O., D.F.C., A.F.C.
Air Commodore W. Wynter-Morgan, C.B.E., M.C.
Air Commodore O. W. de Putron, C.B.E.

K.B.E. (MIL.)

Air Marshal R. Ivelaw-Chapman, C.B., C.B.E., D.F.C., A.F.C.
Air Marshal J. N. Boothman, C.B., D.F.C., A.F.C.

C.B.E. (MIL.)

Air Vice-Marshal W. E. Barnes, M.R.C.S., L.R.C.P., D.T.M. and H.
Air Commodore H. H. Brookes, D.F.C.
Air Commodore J. D. Baker-Carr, A.F.C.
Group Captain W. M. C. Kennedy.
Group Captain J. N. Jefferson.
Group Captain D. I. Coote.
Group Captain M. F. D. Williams, D.S.O.
Group Captain E. L. G. Le Dieu, O.B.E.

ROYAL AIR FORCE PROMOTIONS AND APPOINTMENTS

Among the promotions and appointments announced by the Air Ministry since the issue of the April, 1951, number of this Journal are the following:

AIR MINISTRY

Air Vice-Marshal C. N. H. Bilney, C.B., C.B.E., as Director-General of Technical Services (1), Air Ministry.

Air Vice-Marshal N. S. Allinson, C.B., as Director-General of Manning, Air Ministry.

Air Vice-Marshal A. H. Robson, C.B., O.B.E., M.C., M.Sc., Ph.D., promoted from Air Commodore, on the upgrading of his appointment, that of Director of Educational Services, Air Ministry.

Air Commodore H. A. Constantine, C.B., C.B.E., D.S.O., as Director of Intelligence (Operations), Air Ministry.

Air Commodore E. N. Lowe, C.B., C.B.E., A.D.C., as Director of Organization, Air Ministry.

Air Commodore J. H. Harris, C.B.E., Royal Air Force Regiment, as Director of Ground Defence, Air Ministry.

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Air Commodore B. C. Yarde, C.B.E., as Provost Marshal of the Royal Air Force and Chief of the R.A.F. Police.

Air Commodore W. S. Hebden as Director of Flying Training, Air Ministry.

R.A.F. STAFF COLLEGE (BRACKNELL)

Air Vice-Marshal A. D. Gillmore, C.B.E., as Commandant.

ROYAL OBSERVER CORPS

Air Commodore G. H. Vasse, C.B.E., as Commandant.

FIGHTER COMMAND

Air Vice-Marshal the Earl of Bandon as Air Officer Commanding No. 11 Group.

Air Vice-Marshal R. L. R. Atcherley, C.B., C.B.E., A.F.C., as Air Officer Commanding No. 12 Group.

Air Commodore A. Harvey, C.B.E., as Principal Medical Officer.

Air Commodore J. A. Southwaite, O.B.E., as Senior Technical Officer.

HOME COMMAND

Air Vice-Marshal J. Warburton as Officer Commanding No. 64 (Northern) Group.

COASTAL COMMAND

Air Vice-Marshal G. E. Nicholetts, C.B., A.F.C., as S.A.S.O., Coastal Command.

Air Commodore A. D. Davies, C.B.E., as Air Officer in charge of Administration, Coastal Command.

TRANSPORT COMMAND

Air Commodore J. A. Hawkings, C.B.E., as Senior Technical Officer.

FLYING TRAINING COMMAND

Air Commodore A. P. Bett as A.O.C. 54 Group.

TECHNICAL TRAINING COMMAND

Air Commodore J. Mutch, C.B.E., as Commanding Officer of R.A.F. Station, St. Athan.

MAINTENANCE COMMAND

Air Vice-Marshal G. Combe, C.B., as Air Officer in charge of Administration, Maintenance Command.

RHODESIAN AIR TRAINING GROUP

Air Commodore H. H. Brookes, C.B.E., D.F.C., as Air Officer Commanding.

MIDDLE EAST

Air Vice-Marshal J. A. Gray, C.B., C.B.E., D.F.C., G.M., to be Air Officer i/c of Administration.

Air Vice-Marshal V. S. Ewing, C.B.E., M.B., B.Ch., D.P.H., to be Principal Medical Officer.

Air Commodore C. J. Luce, D.S.O., as Command Defence Officer and Senior R.A.F. Regiment Officer at Headquarters, Middle East Air Force.

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UNITED STATES OF AMERICA

Air Commodore C. L. Dann, O.B.E., for technical duties with the British Joint Services Mission, Washington.

PAKISTAN

Air Commodore J. R. Mutch, C.B., as Assistant Chief of Staff (Supply and Technical Services), Royal Pakistan Air Force.

GERMANY

Air Commodore E. W. Towsey, O.B.E., as Command Defence Officer and Senior R.A.F. Regiment Officer at Headquarters, British Air Forces of Occupation, Germany.

RETIREMENTS

Air Marshal Sir Philip C. Livingston, K.B.E., C.B., A.F.C., F.R.C.S., F.R.C.S.(Edin.), L.R.C.P., D.P.H., D.O.M.S., K.H.S., late Director-General, R.A.F. Medical Services.

Air Commodore O. W. de Putron, C.B., C.B.E., A.D.C., late Provost Marshal of the R.A.F.

ROYAL NEW ZEALAND AIR FORCE

PERSONNEL NOTES

Recent appointments in the Royal New Zealand Air Force include the following:

Group Captain D. W. Baird, A.F.C., as Director of Reserves.

Group Captain B. S. Nicholl as Director of Postings and Personal Services.

Group Captain R. A. C. Carter, D.S.O., D.F.C., R.A.F., as Director of Organization and Staff Duties.

Wing Commander R. M. McKay, A.F.C., as Director of Operations and Flying Training.

Wing Commander K. W. Trigance, D.F.C., as Commanding Officer, R.N.Z.A.F. Station, Lauthala Bay (Fiji).

Wing Commander R. Webb, D.S.O., D.F.C., as Deputy Director of Organization and Staff Duties.

Wing Commander A. A. N. Breckon, D.F.C., as Officer Commanding Administration Wing, R.N.Z.A.F. Station, Wigram.

Wing Commander S. G. Quill, D.F.C., as Officer Commanding R.N.Z.A.F. Officers' School, R.N.Z.A.F. Station, Whenuapai.

Wing Commander J. M. Checketts, D.S.O., D.F.C., as Officer Commanding Flying Wing, R.N.Z.A.F. Station, Ohakea.

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BOOK REVIEWS

Goering. By Willi Frischauer. Published by Odhams Press Ltd., 67 Long Acre, London, W.C.2. 304 pp. Illustrated. 12s. 6d.

Facing page 161 of this book is an illustration symbolizing all the tragedy, futility and cruel comedy of Adolf Hitler's Third Reich, which was built to last a thousand years but succeeded only in devastating half of Europe in twelve. The photograph shows Reichs-marshal Hermann Goering paying homage to Hitler, "the great genius," on his return from Czechoslovakia, which the *Wehrmacht* had just invaded in violation of the Munich Agreement. Goering, his diamond-studded Field-Marshal's baton in hand, faces the Fuehrer and his entourage, whose arms are raised in a Nazi salute. Their faces reflect the uncompromising aggressiveness, self-satisfaction, blind subservience and lust for personal power which form the background against which this biography was written.

Willi Frischauer has no reason to love National Socialism. As Editor of a Viennese newspaper, he watched it spread its tentacles from a Munich beer cellar to engulf first Germany and then his own country. In the thirties he helped to reveal the "Schickelgrueber" story of Hitler's origin, and after the *Anschluss* fled to England, where he became a German and Continental Affairs expert in Fleet Street. Yet there is no evidence of personal hatred in his book; indeed he spares no effort to point out that Goering was a gallant World War I fighter pilot, devoted husband and, in some ways, a likeable, loyal and human minister.

Goering is in fact a first-class biography. But it is more than just that for it also describes the decline and fall of the *Luftwaffe*, which fell victim to the corruption and personal jealousies that were always rife among the Nazi hierarchy. Hitler, apparently, never trusted or encouraged his air force after the Battle of Britain, and as its chief fell from power, so the *Luftwaffe* itself was harried, divided, misdirected and thrown away on lost causes, until finally it ceased to be an effective force. Nor did Goering do much to save it, for, under the influence of powerful drugs and the enmity of other ministers, he turned his attention more and more from his responsibilities and concentrated on looting Europe's art treasures.

Goering's trial and death at Nuremburg are almost an anti-climax after Frischauer's horrifying account of the last days of the Third Reich, during which Hitler ordered the execution of his still-faithful henchman; and the account of Goering's last meeting with his wife is moving in the extreme. Yet one is left in little doubt of his guilt, which was "unique in its enormity," and the greatest tribute that can be paid to Frischauer's book is that the Goering it portrays is so exactly like the man described by Sir David Maxwell-Fyfe, who mercilessly cross-examined him at Nuremburg. "Goering," said Sir David, "had a quick brain, an excellent memory, a complete mastery of political approach to mass German opinion, courage and a power to get himself liked by the great majority of people that he met. When these qualities are coupled with complete ruthlessness, vanity and greed, you have a figure that could not be laughed off."

J. W. R. T.

Fifty Years Fly-Past. By Geoffrey Dorman. Published by Forbes Robertson Ltd., 17 Fleet Street, London, E.C.4. 346 pp. Illustrated. 15s.

It would be wrong to regard this book as a straightforward history of the first fifty years of powered flight, because it is not arranged as a continuous, chronological narrative. Mr. Dorman's main object seems to have been to pack as many facts as possible into 346 pages, and the result is a sort of aeronautical encyclopædia, a useful reference volume for the enthusiast rather than a chatty story of the development of flying for the layman.

Each of the forty-three chapters of *Fifty Years Fly-Past* is complete in itself, and they cover almost every aspect of aviation. Typical are those which describe the development of Atlantic flying from 1913 to the present day, the history of the Royal Aero Club, the Schneider Trophy contests, the story of jet propulsion and the growth of the de Havilland Company. There are one or two minor errors here and there, but the overall impression is of competent authorship, which is hardly surprising as Geoffrey Dorman writes from first-hand acquaintance with most of the people and events mentioned in his text.

J. W. R. T.

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The Aeroplane Directory, 1951. Edited by W. C. M. Whittle, A.R.Ae.S. Published by Temple Press Ltd., Bowling Green Lane, London, E.C.1. 685 pp. and Index. 15s.

The addition of another 111 pages in this year's *The Aeroplane Directory* bears testimony both to the continued expansion of British commercial and military flying, and to the care taken by the Editor of this aviation "Who's Who and Who's Where" to ensure that it is as comprehensive and up to date as possible. Significantly, the most extensive revisions are in the Royal Air Force section, where, for example, changes in the composition of the Air Council resulting from the merging of Technical and Equipment services have been duly recorded, as has the reconstitution of our Reserve Forces within Home Command. Another sign of the times is a further shrinkage in the number of Air Charter companies still operative.

Expansion of the British and Empire Aircraft Industries section reflects the increase in production to meet defence requirements, and a large number of new sub-contractors are now listed, whose normal products range from razors to cinema organs.

The Editor of *The Aeroplane Directory* has an unenviable job, rather like that of the men who paint the Forth Bridge and, proverbially, as soon as they have finished have to go back to the other end and start all over again. Inevitably, a few of the entries must be out of date as soon as they are published. It is to the credit of Mr. Whittle and his assistants that *The Aeroplane Directory* is comprehensive and reliable enough to be accepted throughout the world as the standard guide to British aviation.

J. W. R. T.

MacArthur, Man of Action. By Frank Kelly and Cornelius Ryan. (Doubleday & Co., New York.)

The Riddle of MacArthur. By John Gunther. (Hamish Hamilton.)

General MacArthur is one of the most controversial figures in American public life today; he evokes great devotion or hatred from all who know him. His recent recall from his posts in the Far East has given added point to the controversy that rages around him and his achievements. Is he a really great man, as his protagonists aver? Is he a cross between Cæsar and Alexander? Is he simply an American general who has had a long and successful career. Taken together both books supply the British reader with enough information to make an estimate of the man and his importance, not only in America but in international affairs.

Man of Action is written by two journalists, who were war correspondents in the Pacific, and is a straightforward piece of reporting; they present a series of photographic impressions of the general's career, enlivened sometimes with candid snapshots. John Gunther is more concerned to examine the success or otherwise of the policy General MacArthur has prosecuted as Supreme Commander for the Allied Powers in Japan, and to reveal the self-imposed mission, which the general once declared "only God or the United States' Governments could prevent" him from accomplishing.

Son of a father who had an exceptionally vigorous military record, General MacArthur's career as a soldier has been brilliant. Entering West Point in 1899, he graduated with the highest record of marks that any candidate as yet has obtained. Because of his record, he automatically went into the engineers. From the time he joined the General Staff in September, 1917, his rise was meteoric. He conceived the idea of the famous Rainbow Division, accompanied it to France, won nearly every medal he could while serving with it, and at last commanded it. He was the youngest superintendent West Point ever had. In 1930, at the age of 50 he became the youngest Chief of Staff in the history of the U.S. Army. Seemingly he had reached the pinnacle of military fame when he retired in 1935. When, two years later, his old friend President Quezon suggested that he should go out to Manila as military adviser, with the unprecedented rank of Field-Marshal, he retired from the U.S. Army and devoted himself exclusively to the Philippines.

Throughout his life he seems to have held the example of his father constantly before him. "Whenever I perform a mission, and think I have done it very well, I feel that I can stand squarely up to my dad and say 'Governor, how about it?' " he is reported to have told a friend in Tokyo not very long ago. But more obvious was the tremendous influence exercised by his mother over him. She it was who accompanied him to West Point, coaxed and encouraged him and never once let him forget that great things were expected of him. Indeed all who know her say that but for her brilliant management of MacArthur in his teens, he would not be the "military statesman" that he is today. She was absent when he got himself engaged for the first time, but it was she who chose his second wife after his first marriage had ended in the divorce court.

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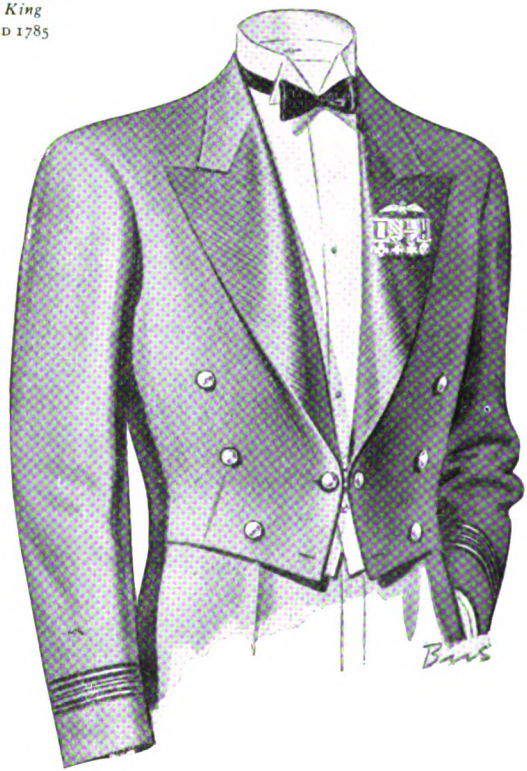

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He has generally been regarded in America "as the very symbol of an incarnate military omniscience." Few people dared to criticize him when he lost his aircraft in the Philippines on the ground. He thought that Manila could be held "because Corregidor was the strongest single fortified point in the world." He did not think that the Japanese would mount the type of attack they did. To avenge Bataan became an obsession—"I will return"—despite other proposals to end the war in the Pacific more speedily. Against these criticisms his forces made eighty-seven different major amphibious landings and they were never pushed off any island. But more damaging to his military reputation was his failure to realize what the outbreak of the civil war in Korea meant and initially to minimise its importance.

According to Mr. Gunther, American intelligence circles were sensationally ill-informed about the situation in Korea. The United Nations Committee on Korea reported to Lake Success that the United States officers in Korea refused to accept at face value, and in fact ignored well documented South Korean intelligence of an impending attack a full six weeks before it occurred. Korea, it has been argued, was no concern of the Supreme Commander for the Allied Powers in Japan, but with the history of Korea as a sort of Far Eastern "Low Countries," it might have been prudent to watch the situation there most carefully. Yet MacArthur redeemed his military reputation with his brilliant Inchon landings—inspired, it is said, by the Wolfe—Sanders attack on Quebec.

The success or otherwise of his policy in Japan can scarcely be judged as yet. Under him the Japanese appear to have made a beginning in democratic government. Before the Second World War they were known to be the world's best copyists. Whether they transfer their industrial abilities to governmental remains to be seen.

Despite what in other men would seem to be theatrical posturings, pompous utterances in the ornate and baroque prose of his communiqués, the impression remains that he is a big man. Whether he is great in the sense that Cæsar or Alexander were, time alone will tell. He is certainly a prominent and controversial figure in American life. He seems hardly likely to just fade away; at present he is exercising a considerable number of the Truman administration. Anybody or anything which disturbs American policy is worth while trying to understand, and both books under review contribute some estimate of the personality of General MacArthur.

T. M.

The Army Air Forces in World War II. Volume IV, the Pacific—Guadalcanal to Saipan. Edited by W. F. Craven and J. L. Cate.

This is the third volume to appear of the projected seven volumes dealing with the participation of the United States Army Air Forces in the Second World War. It deals exclusively with Far Eastern theatres of war: India, Burma, China, and throughout the Pacific from the time of the Japanese advance with the Allies struggling to halt the enemy's drive south-westwards in the lower Solomons, and in south-east New Guinea. Six of the United States Army Air Forces were engaged; the Fifth with General MacArthur's forces in the South-West Pacific area; the Seventh in the Central Pacific; the Eleventh in the North Pacific, operating from Alaska towards the Aleutians; the Thirteenth in the Solomons; the Tenth in India and Burma, and the Fourteenth in China.

The geographical situation of these air forces tended towards individualism. There was not the unity of command in the Pacific that characterized the war against the axis in Europe. In a way the operations of the various air forces reflected the disunity; each air force had a different problem to contend with, and in the examination of the work of the six air forces, the diversity of the uses of air power are clearly demonstrated. The task imposed on the editors of and contributors to this volume by this is no mean one, and they have wisely let the story of each air force be told, and unity given to the volume by the policy of the Combined Chiefs of Staff.

The conditions under which the air or air wars, for each air force in fact conducted its own campaign, were vastly different from those prevailing in Europe. It is the great quality of this volume that it illustrates clearly how different was that air war. There was considerably less of the tactical air support, which was part and parcel of any operations on the ground in North Africa, Sicily, Italy, and in the liberation of North-West Europe. The physical limitations of ground and weather give some explanation for this divergence from what had become accepted doctrine, both by the U.S. Army Air Forces and the R.A.F. This is not to say that it was not tried, as indeed it was in Burma, but it was never of the scale that was of common occurrence in European operations.

The explanation perhaps lies in the fact that Japan was an island Empire. Indeed the problems confronting Japan were the same as confronted the United Kingdom, but in the

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reverse order. This country fought its battle of Britain first, and then proceeded to win the battle for communications and supplies, whereas Japan was first by the very nature of her conquests forced to fight the battle for her supplies first. As the Japanese forces swept down into the Pacific, they may have conquered territory, but they extended their lines of communication enormously. Initially this was to their advantage, but as soon as the Allied forces strength increased this could be and was turned into an immense liability for Japan. In attempting to defend and reinforce the islands she had conquered, the enemy was forced to employ resources which he would have been better advised to save for the Battle of Japan.

Pacific warfare was island warfare, and by the imaginative use of their air forces, the Americans could isolate an area, whenever they chose. Later, towards the period covered in this volume, it was not necessary to capture an island. It could be by-passed and occasionally raided. Naturally, in this work the United States Army Air Forces were not alone. The U.S. Navy and its naval air service co-operated. Their combined attacks on shipping almost destroyed the merchant fleet of Japan, and her industrial resources were not great enough to make good the high rate of sinking. Once an island empire is denied the free use of her communications it is only a matter of time before she collapses. The occupation of island bases by the Allies of course paved the way for the final air assault on Japan, which during the period under review was immune from air attack on its industrial capacity.

Conversely, the forces in the Pacific suffered from the great distances they were from their centres of supply. A glance at a map of the Pacific and the Far East will demonstrate the immense distances the Allied lines of communication stretched. Not only distance, but there was the limiting factor of bottoms; there were not enough ships to carry all the supplies available. The commanders in the Pacific suffered from the decision of the Combined Chiefs of Staff that first priority should be given to the European theatre of operations. Naturally they kept demanding more men and aircraft than the enemy's estimated order of battle in 1942 would seem to indicate as necessary; but that is a common complaint. Once, however, the pipeline was full and supplies were flowing along it, the defeat of Japan was only a matter of air bases and time. But it must have seemed galling to the Air Force commanders in the Pacific to see replacements and reinforcements flowing to the U.S. Navy, for whom the Pacific was first priority.

As in the two volumes previously published, this is the work of a team of contributors, all of whom have served with the United States Army Air Forces; and suffers from the accepted limitations of a piece of collaboration. The volume is well illustrated with maps and some good action photographs. Undoubtedly the editors and contributors have worked to produce an authoritative account of the air war in the Pacific, and they are to be congratulated on their production. Not the least of its qualities will be the comparison it will offer with the last published volume for the student of air power in emphasizing the many uses of the applications of air power.

T. M.

A Sailor's Odyssey. By Admiral of the Fleet Viscount Hyndhope. (Hutchinson.)

The intention of Viscount Hyndhope, better known as Admiral Cunningham, in writing his memoirs was because he "wished to do justice to those under whom I served and from whom I learned so much in my earlier years at sea, and also to pay a deserved tribute to those many who I later had the honour and privilege to command in the Mediterranean and elsewhere," and he has succeeded in his purpose. Naturally, he writes about himself and his career, but he never loses sight of the officers and men with whom he served. His autobiography is a memorial to them as well as a tribute to his narrative skill. For a man who once urged as a reason why he should not be appointed as Deputy Chief of Naval Staff that he could not express his thoughts on paper, his book is the very denial of such a self-accusation.

Admirals' lives—apart from their naval career—are seldom interesting. Nelson was an exception, but he was an exception in so many ways, not the least that he found Southey for his biographer. Admiral Cunningham needs no biographer. From the moment his book opens with a Johnsonian directness, he never loses the reader's attention. About his childhood in Dublin and Edinburgh he writes amusingly, and of his early career in the Navy. It comes as a shock to learn that an Admiral of the Fleet may once have been known by his contemporaries as "Meat Face." Through the First World War, during which he spent most of his service in the Mediterranean, through his between-the-wars appointments till he retired from the highest naval office of First Sea Lord, he carries his story along, rather like a destroyer at speed, throwing up as spray amusing anecdotes.

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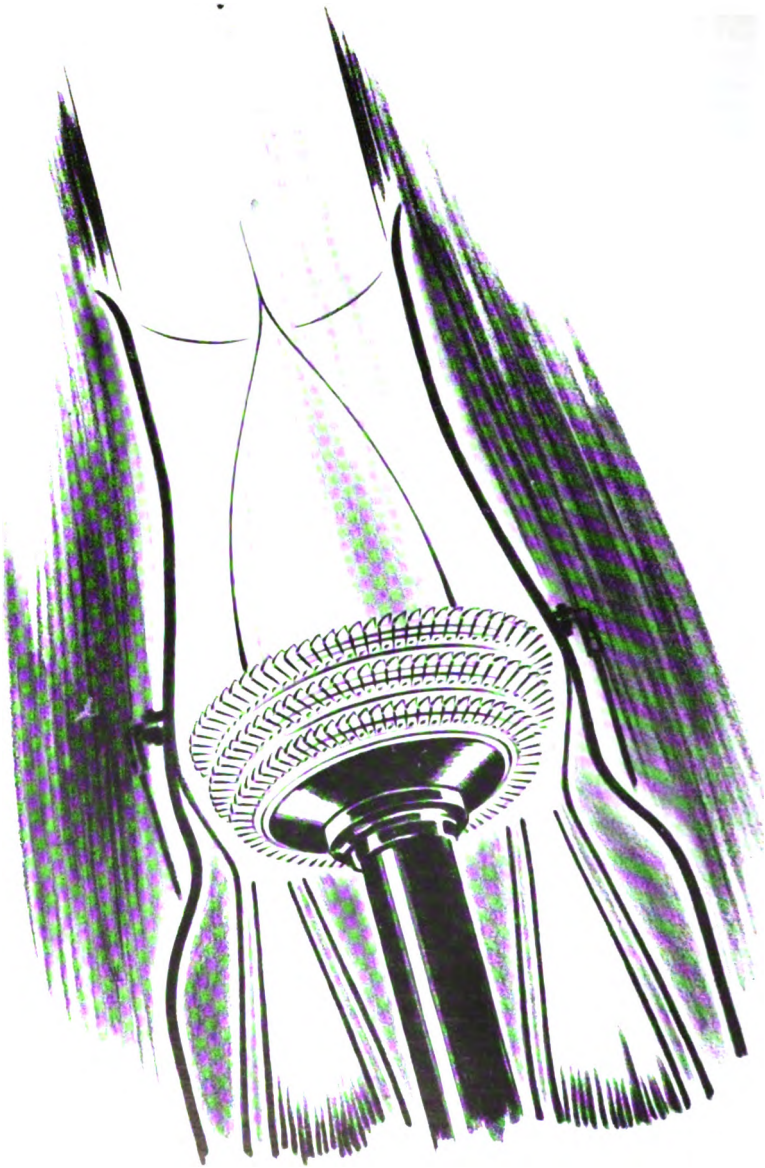

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There is no doubt from his pages that he was happiest at sea. His service career is the denial of Gilbert's advice about sticking to one's desk. He was never happier when he could be at sea with the heave of a deck under his feet. Certainly his descriptions of the naval battles in which he took part have the smell of cordite and salt water about them. He does not criticize mistakes made in the midst of battle. He admits that in the heat of a naval engagement the commander of the fleet has to make split-second decisions, when the situation is "very muddled." He has little time for the armchair critic looking back with a great deal more information than the admiral had, and then proceeding to pontificate upon what should or should not have been done. "Calm reflection in an armchair in the full knowledge of what actually happened, is a very different matter to conducting an operation from the bridge of a ship in the presence of the enemy. Instant and momentous decisions have to be made in a matter of seconds."

Apart from his resounding naval victories over the Italians, perhaps his greatest triumph was in arranging a peaceful settlement with Vice-Admiral Godfroy, who commanded the French naval units based on Alexandria at the time of the fall of France. The difficulties of an already ticklish situation were increased as soon as the news of the "melancholy action" at Mers-el-Kebir reached the French admiral at Alexandria. By a mixture of tact, bluff, diplomacy, and plain speaking, Admiral Cunningham persuaded Admiral Godfroy to disarm his ships, and thus solved an acute situation. With the French ships unarmed and all their oil discharged, the fleet in the Eastern Mediterranean could then proceed with its lawful task of defeating the Italian Navy.

He is a man of strong opinions, and he has a great wealth of experience to back up his views. He considered the "Geddes axe" the worst advertisement the Royal Navy ever received, and it gave it a blow from which it could not recover in time for the Second World War. On the question of Command, Allied and British, he has a good deal that is pertinent to say, and with his experience of serving as a member of a triumvirate, and under a "Supremo" his words merit attention. ". . . I have never been a great believer in Supreme Commanders. Among Allies they may be a necessity, and in the case of General Eisenhower the organization was an outstanding success; but I am quite sure with our own three fighting services, much better results are obtained if the three Commanders-in-Chief are . . . determined loyally to support each other to the mutual advantage. . . .Under a "Supremo" the heads of the three Services tend to drift apart. Without one they have to get together, and if they settle and loyally strive after the same object they are bound to get agreement. . . . The Supreme Commander, in fact, was an invention of the Americans, and when they themselves were up against the problem of finding one to conduct the final operations against metropolitan Japan, the Army and Navy failed to reach agreement. General MacArthur and Admiral Nimitz were left independent of each other."

It is interesting to note that while in his despatch on the Landings in North Africa he makes no mention of the help the seaborne forces received from the air in ensuring the safety of the assault convoys, in his book he writes "The immunity (of the 'Torch' Convoys) was largely due to the Allied aircraft which kept the convoy areas clear of enemy shadowers and forced his U-boats to remain submerged." He fully appreciated the effect of air power in the Mediterranean, although at one time he was campaigning for a sort of "Coastal Command" with specialized aircraft. At that time Middle East's resources did not allow such diversion of aircraft, but the Admiral, perhaps, fails to realize that the provision of such aircraft would have been a liability for the Air Commander.

A Sailor's Odyssey is a stimulating record of a brilliant naval career. Yet the modesty of Admiral Cunningham is impressed on one throughout the volume. All the honours he received, he accepted not for himself, but because he believed that they were tributes to the Navy, and to the officers and men with whom he served. "After all," he concludes, "it is the men who win battles . . . and . . .the fighting spirit was never lacking."

T. M.

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NEW BOOKS

BIOGRAPHY

The Essential T. E. Lawrence. By David Garnett. (Cape, London; 1951; 12s. 6d.)

The Riddle of MacArthur: Japan, Korea and the Far East. By John Gunther. (Hamish 1951; 21s.)

WORLD WAR II

A Sailor's Odyssey. By Admiral Viscount Cunningham of Hyndhope. (Hutchinson, London; 1951; 21s.)

The United States Army in World War II. The War Department; Chief of Staff—Pre-war Plans and Preparations. By M. S. Watson. (Department of the Army—Historical Division: Washington, D.C., U.S. Government Printing Office; 1950; $3.75.)

The Army Air Forces in World War II. Vol. IV. The Pacific—Guadalcanal to Saipan—August, 1942-July, 1944. Fully illustrated. 825 pp. Edited by W. F. Craven and J. L. Cate. (Cambridge University Press, London; 45s. net.)

No. 5 Bomber Group. 19 illustrations. 246 pp. By W. J. Lawrence and Preface by Air Chief Marshal Sir Ralph Cochrane, G.B.E., K.C.B., Vice-Chief of the Air Staff. (Faber & Faber, London; 1951; 15s. net.)

The Great Escape. Illustrated by Ley Kenynon. By Paul Brickhill. A tale of group heroism, determination and ingenuity. A record of the triumphant tragedy of Stalag Luft III. (Faber & Faber, London; 1951; 10s. 6d. net.)

The Big Show. By Pierre Clostermann, D.F.C. With a Foreword by Marshal of the Royal Air Force Sir John Slessor, G.C.B., D.S.O., M.C. Fully illustrated. 256 pp. (Chatto & Windus, 1951; 12s. 6d. net.) The author, a Frenchman, was a pilot who fought throughout the Battle of Britain and beyond with the R.A.F. His book contains realistic descriptions, from the pilot's point of view, of combat in the air during this period and a general description of life in the Air Force in the hectic days of war.

The Wonder Book of the R.A.F. With a Foreword by Air Vice-Marshal Sir Charles Longcroft, K.C.B., C.M.G., D.S.O., A.F.C. Eight colour plates and nearly 300 illustrations. 256 pp. (Ward Lock, 10th July, 1951; 12s. 6d. net.) This book tells about some of the past glories of the R.A.F. and of the two Services out of which it grew—the Royal Flying Corps and the Royal Naval Air Service. But chiefly it is concerned with the R.A.F. of today, with jet bombers and jet fighters, radar, navigation, etc.

POLITICAL

Wells of Power: A Regional and Global Study of the Oilfields of South-Western Asia. By Sir Olaf Caroe. (Macmillan, London; 1951; 15s.)

Soviet Documents on Foreign Policy. Vol. I, 1917-1924. Issued under the auspices of the Royal Institute of International Affairs. Editor, J. Degras. (Oxford University Press; 1951; 42s.)

The Rise and Fall of the Japanese Empire. By D. H. James. (Allen & Unwin, London; 1951; 21s.)

Hitler's Interpreter. The Secret History of German Diplomacy, 1935-45. By Dr. P. Schmidt. (Heineman, London; 1951; 15s.)

MISCELLANEOUS

A Century of Science, 1851-1951. Editor, H. Dingle, and various specialist authors. The Editor is Professor of the History and Philosophy of Science in the University of London. (Hutchinson, London; 1951; 15s.)

The Principles of Air Navigation. The author, Wing Commander E. W. Anderson, O.B.E., D.F.C., A.F.C., F.R.Met.S., is well known in the R.A.F. as a highly qualified navigator, who has navigated all round the world, including the North Pole flight in the famous aircraft, *Aries*. He has had experience with both British and American airline companies. Under the stimulus of war, new equipments and new methods were introduced into air navigation. This book describes them in a simple and readable form, but includes enough of the theory to satisfy the inquiring mind. 264 pp., fully illustrated. (Methuen & Co., London; 25s. net.)

The Aeroplane Directory of British Aviation. Including who's who in British aviation. Edited by W. C. M. Whittle, A.R.Ae.S. 1951 Edition. 689 pp. (Temple Press, London; 15s. net.)

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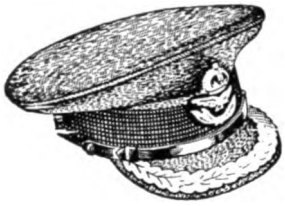

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Group Captain A. H. Stradling
O.B.E., R.A.F. (Retd.)
Author of "Customs of the Services"
Editor of "The R.A.F. Quarterly"

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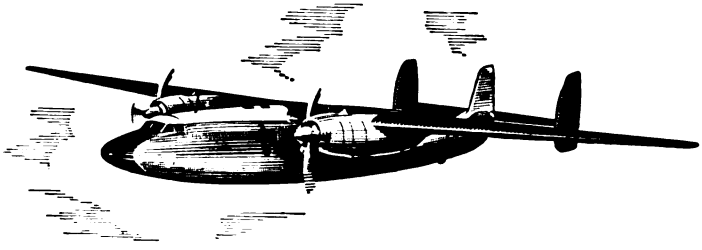

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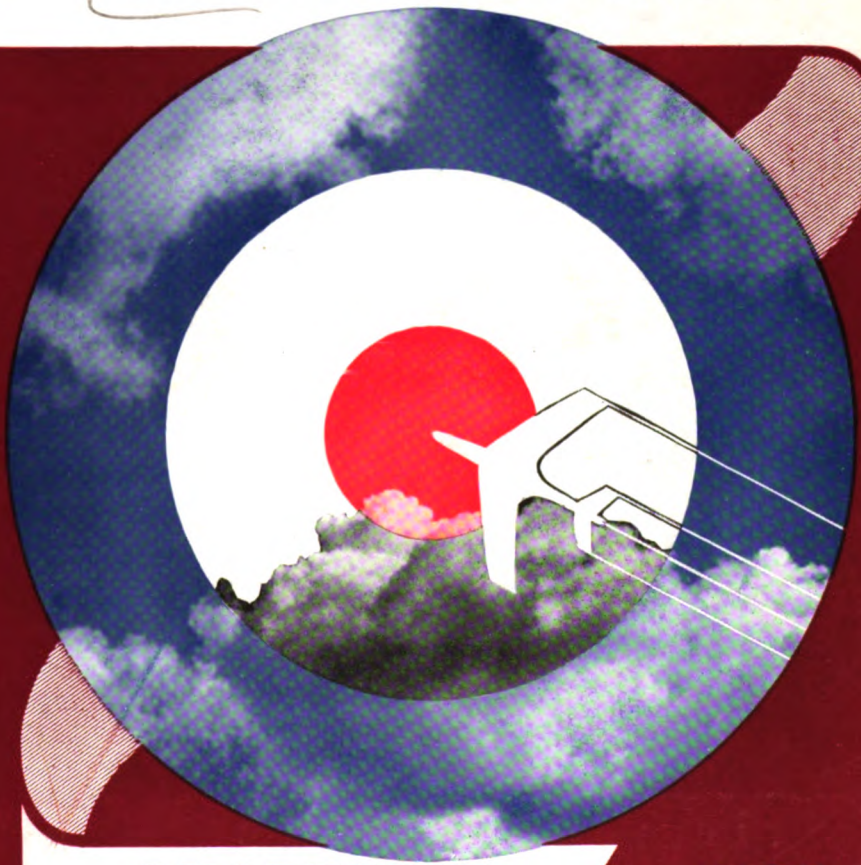

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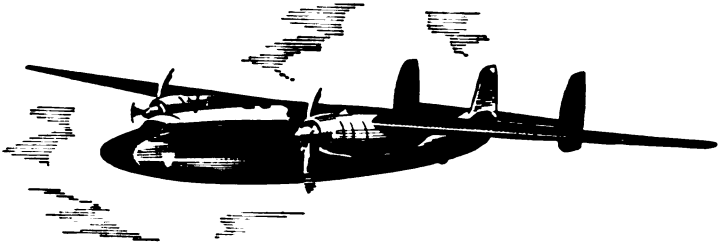

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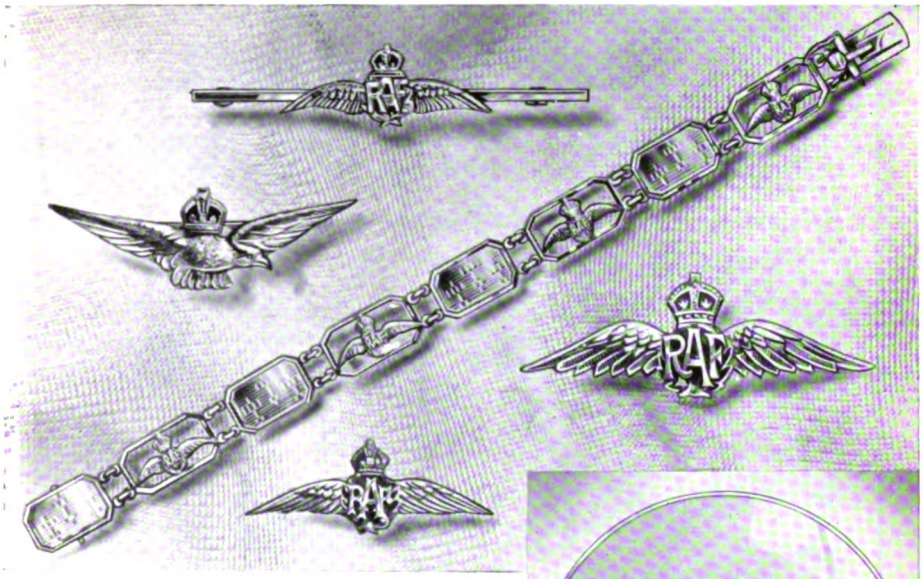

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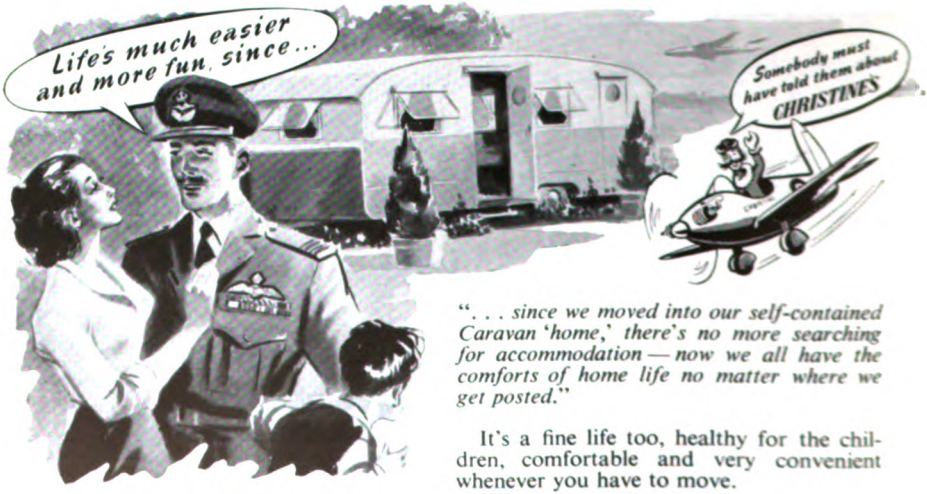

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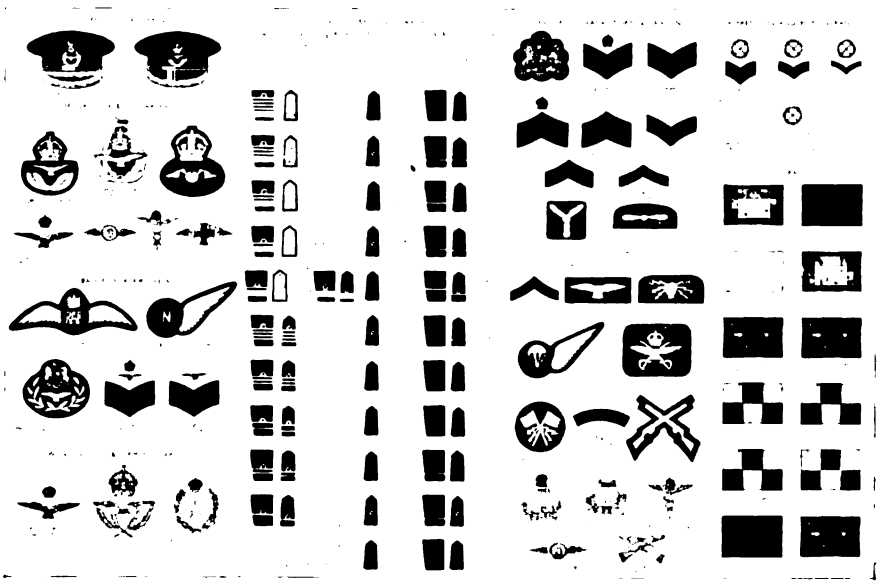

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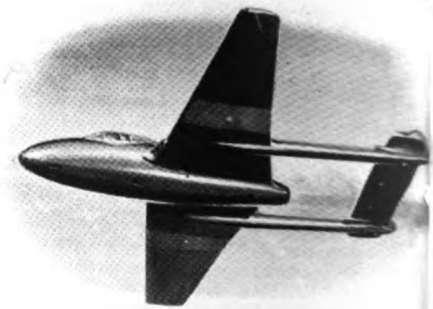

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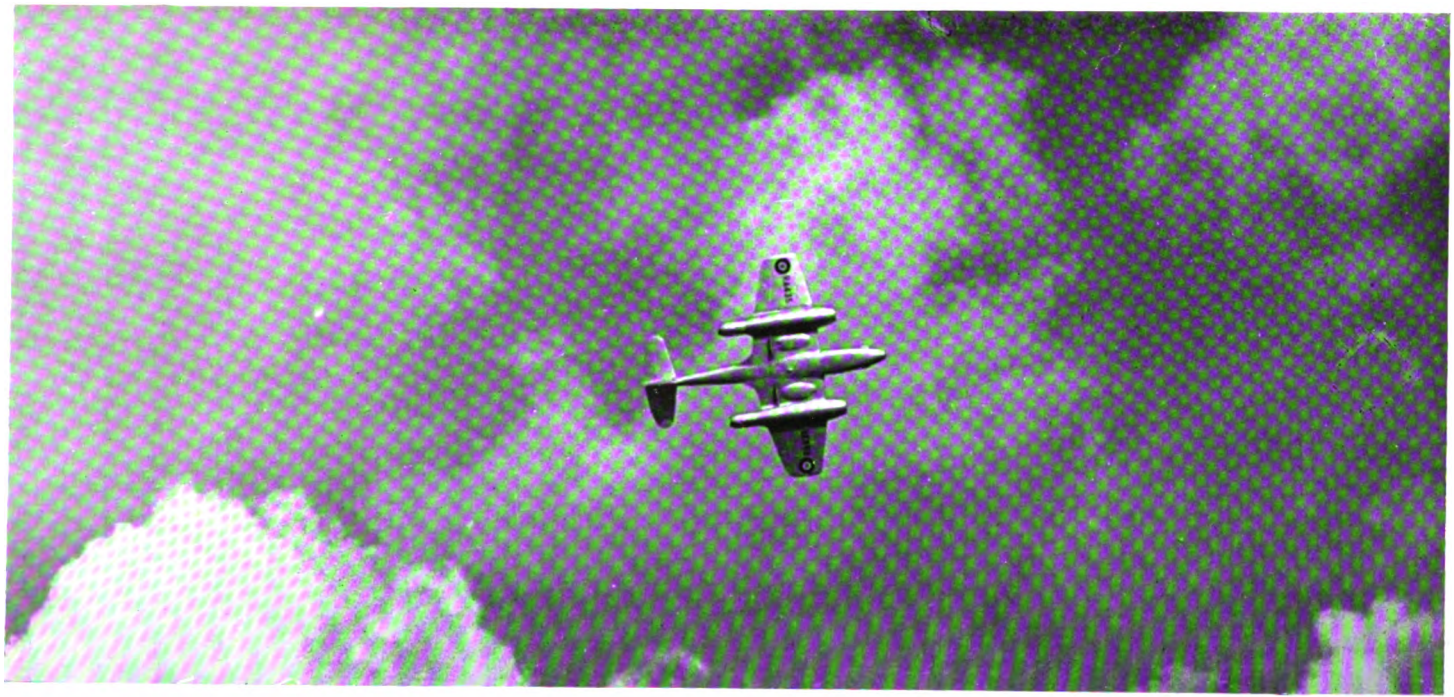

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EDITORIAL

THE EPIDEMIC OF 1951

THE British people are in the grip of the most widely spread epidemic that this country has yet experienced. It has been prevalent for such a long time that those not yet affected by it are naturally gravely concerned as to what will be the outcome.

The most obvious symptom is "lassitude," utter and complete. In others it takes the form of an "anxiety neurosis," brought about by the knowledge that a large part of the nation is suffering from a *laissez-faire* condition, with no sign of recovery.

As regards the latter, their anxiety is twofold. Firstly, the fear that the final stage of "lassitude" will descend upon them. Secondly, their unfulfilled desire to dispel the epidemic, by doing something personally to save the nation from the obvious results of its continuance. While they maintain this desire there is some hope of their escaping the final stage, "complete lassitude," providing that they exert their will power and become active in fighting the epidemic, by undertaking some work of national service, instead of remaining passively anxious and merely brooding over the present unsatisfactory state of national affairs and the perils of the future.

The whole nation is experiencing a kind of "nightmare," the general conditions of which are so familiar to everybody. The lively knowledge of some horrific danger swiftly approaching; one which we cannot define very clearly because of an inability to pierce the darkness in which we are surrounded, but one which threatens to overwhelm us with a fate as terrifying as our limited imagination will allow us to conceive. Our immediate desire is to flee as speedily as possible to the light and safety, which in our subconscious mind we know is there. We try to take this very desirable action. (Now comes the "anxiety neurosis.") We find we cannot; our limbs refuse to perform their normal action. With leaden feet, seemingly glued to the floor, we try to struggle forward; any progress we make is irritatingly slow and meanwhile the "bogy" is rapidly drawing nearer and nearer.

Those not affected by this epidemic are the men and women who are actively engaged in fighting it. These include those in our Fighting Forces, the thousands employed in our aircraft factories, in our shipyards, in Civil Defence and in all those occupations where Britons are engaged in feverishly building up the defences which this country must have as speedily as possible if the storm, which we know looms in the East, is not to break over these islands and overwhelm us.

Those who suffer from either symptom of the prevalent malady, whether "lassitude" or merely "anxiety neurosis," would undoubtedly find a cure in any form of employment connected with the preparations to defend their native land. It is, therefore, the duty of those who are immune to awaken the afflicted and point out to them the obvious cure. Our Royal Air Force is still grievously short of skilled men, also those for building up our additional air crews, our Fighter Control Units are still undermanned, Civil Defence can absorb thousands more and there is a niche for every able-bodied citizen in work of national importance.

The Defence Services could do much to help themselves in filling the "gaps." If every officer and man used his influence to recruit but one suitable individual of the category still required, there would be no shortage of personnel; also

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they would be rendering their country, as well as the new entrant, a service for which both would be grateful.

It is too late to leave this until the day of the crisis—it takes time to weld a whole nation together for its defence.

Are Britons still patriotic, or have we become a nation of hypochondriacs?

THOUGHTS ON COMMUNISM

Recently a medical journal published an article, "Is Smoking Injurious?" The author began with a list of things which could *not* be attributed to over-indulgence in smoking. It was unlikely to produce "housemaid's knee," "flat feet," "baldness" or "corpulency." He then gave a list of evils which might clearly be traced to the rapid increase in the number of heavy smokers. This included such organic disorders as "dangerous heart conditions," "impotency" and "cancer," all of which threatened our continued existence.

Let us follow the same line of approach in our thoughts upon Communism, as that of the doctor in his thesis on the evils of excessive smoking.

Despite the attempts of hysterical sensationalists to do so, we cannot attribute to the influence of Communism "influenza epidemics," "flying saucers," "catastrophies at sea," "poliomyelitis," "floods" or "avalanches in Switzerland."

Let us consider the evils which are wrought by Communism.

The fate of those nations who failed to check its malignant growth, and who fell under the honeyed spell of its propaganda, reminds us of the story of "The Walrus and the Carpenter."

Now lying on the Russian beach are the empty oyster shells of Estonia, Latvia, Lithuania, East Finland, Poland, Rumania, Czechoslovakia and those of smaller molluscs. Also on that dread walk along the seashore are Manchuria, Outer Mongolia, China, Tibet, Malaya and Korea. In phoney peace proposals we hear the echo of the Carpenter's "I deeply sympathize," as he brushes away a tear; no doubt we shall also hear "Cut us another slice" as that large hand reaches out for a fatter and juicier oyster.

Communism in the United Kingdom, with all the privileges it now enjoys, is growing as it did in those other unfortunate countries. It fans to a flame class hatred and sets father against son and brother against brother. Whilst this country is engaged, with U.N.O., in a war against Communism, we give freedom of action to that section of our countrymen who give allegiance to, and act under, the orders of Communists. We allow them the same privileges and freedom of speech as loyal and patriotic citizens. This freedom has allowed them to infiltrate into the main nerve centres and blood-stream of our national life; yet, with feverish haste and crippling cost to the country, we are building up all our Defence Services to prevent this very ideology being thrust forcibly upon us by Russia. That the Communists in this land of ours act under orders from the U.S.S.R. has been admitted; that the aim of Communism is to undermine our financial stability and disrupt our ordered government is known. The enemy within the gates is often more dangerous than the one without the walls of the fortress.

As a non-political journal, we must content ourselves with these few statements of fact and refrain from airing our opinions. We must, in fact, be that nearest thing to an oyster, just a "clam."

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MORALE AS OBJECTIVE

By J. M. Spaight, C.B., C.B.E.

THE CASABLANCA CONFERENCE

WHETHER enemy morale was a profitable objective was a question upon which the American and British strategic planners did not quite see eye to eye in the Second World War. The question was discussed at a good deal of length at the Casablanca Conference in January, 1943. The official history of the United States Army Air Forces states: "American airmen were still confidently of the opinion that, by precision attacks on 'bottleneck' industries, German production could be paralyzed. British bombardment experts, on the other hand, continued to emphasize enemy morale."[1] The decision reached was that the American Air Force should adhere to the system of precision bombing and the Royal Air Force to that of target area attacks. As the United States Strategic Bombing Survey states, the latter attacks were "intended primarily to destroy morale, particularly that of the industrial worker."[2] They supplemented the war of propaganda conducted by radio and leaflet dropping and designed likewise to undermine enemy morale.

CIVILIAN MORALE

It might be said that every act of warlike violence is an attack on morale. In battle a commander seeks to obtain a decision by destroying the spirit of the enemy troops no less than their bodies and weapons. The defeat of them is a blow at the morale of their government. It is, in fact, the normal way of inducing that government to give up the struggle and come to terms. The fighting and slaughter are only means to that end. The enemy leaders' minds have to be influenced in (from the other belligerent's standpoint) the right direction. It is not, however, in such a general sense that attack on morale is to be understood here. Field operations are excluded from consideration. The subject dealt with here is the kind of attack on morale which was alone in question at the Casablanca meeting: that is, broadly, civilian morale.

Attack on morale, for this limited purpose, may mean either of two different things. The morale that is attacked may be that of the population of the country as a whole, or it may be the morale of that part of the population that is engaged in the industries contributing to the war effort. The purpose of the attack in the former case is to induce a spirit of defeatism in the minds of the population at large, and in the latter to slow down or stop work which is essential to a successful prosecution of the war. Here, again, the ultimate aim in each case is to influence the enemy government and to make it disposed to enter into negotiations for the ending of the war, either because it recognizes that the country as a whole is too utterly dispirited to fight on, or because it cannot hope to maintain the war effort that is needed to ensure a successful issue.

THE PRACTICE OF SEA AND LAND WAR

There is nothing new in principle in war against morale. Precedents for it may be found in both naval and land warfare, in the practice of which one can trace,

[1] *The Army Air Forces in World War II*, Vol. 2, Europe: Torch to Pointblank, 1949, p. 305.

[2] *Over-all Report (European War)*, 30th September, 1945, p. 71.

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too, the distinction between the wider and narrower conceptions of it referred to above. Naval blockade is an example of the wider attack on morale. Unlike the interception of contraband, which is aimed (in principle, at least) at preventing the enemy from receiving supplies utilizable for warlike purposes, blockade stops or tries to stop all sea-borne trade with the blockaded part of the enemy territory and in so doing makes no distinction between war workers and others. It is thus a measure aimed at general morale, though it affects incidentally the enemy's war effort.

It differs, of course, from air attack on morale in that it does not involve direct danger to life and limb for the enemy population who are to feel the ultimate effect of it. There was, however, a usage of the older war under which attack on morale did involve such personal risk for non-combatants. It was to be found in the bombardment of defended towns by land artillery. It is specifically recognized in the chapter on the usages of war in the British official manual of military law. This states: "No legal duty exists for the artillery force to limit bombardment to the fortifications and defended border only. On the contrary, destruction of private and public buildings by bombardment has always been, and still is, considered lawful, as it is one of the means to impress upon the local authorities the advisability of surrender."[3] In case it might be thought that it was not contemplated that the inhabitants of the defended town would themselves be exposed to danger, for they might have been evacuated, a later provision of the same rules states that the commander of an investing force is under no obligation to allow non-combatants, women, children, aged, sick and wounded, to leave the besieged place.[4] The circumstances are, in fact, comparable at first sight to those in which air attack is made on an urban centre for the purpose of influencing the inhabitants' morale.

There is, however, the important difference that in the latter case there is no question of enforcing the surrender of the town where, as is normally the case, fighting by ground forces is not proceeding at the same time within it (see the reference to Rotterdam, later). The purpose in strategic air bombardment is to destroy military objectives; that, as will presently be shown, is what is claimed by the attacking belligerent, and claimed in most cases in perfectly good faith. The difference is not of theoretical importance only. There has been in strategic air operations no disposition to claim that the usage of land warfare referred to above justifies the bombardment of a town in all its parts. On the contrary, it is implicitly admitted that that usage does not apply to air attack; if it did there would be no reason to aim at military targets only.

THE "AMBIVALENCE" OF ATTACK ON MORALE

Clearly, what the effect of an attack on morale will be will vary with the nature of the government of the enemy country and also with the national character of the enemy people. If the government were a democratic one the effect might be to induce it to seek the termination of the war either because there was widespread popular pressure to that end, or because the government was desirous of its own accord to spare the citizens further suffering. That kind of official reaction to the attack on morale is unlikely to be found in a police State. Such a State does not allow popular pressure to be exerted and has no regard to the sufferings of the people. It is quite a different matter when the morale that is affected is that of the industrial workers. If they are driven to abandon their benches, forges and assembly lines the war effort is reduced and the government may be powerless to

[3] *Manual of Military Law*, Chapter XIV, 1936, para. 122.
[4] *Ibid.*, para. 125.

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compel them to return. A stage may thus be reached when there is no course but to seek an end to hostilities.

Whether and how quickly or slowly that position is reached is obviously dependent on the human factor of the problem. The breaking strain will be imposed sooner upon one nation than upon another. It is all a question of ingrained strength or weakness of will, of toughness or pliability, e.g., "guts" or the opposite of "guts." One nation will endure to the end, with head bloody but unbowed. Another will throw up the sponge at an early stage in the fight. Bombing for moral effect, Mr. S. T. Possony has said, is ambivalent in its action; it may sometimes produce negative, sometimes positive results; it may strengthen morale instead of weakening it.[5] What the effect will be is a gamble in possibilities. There is no cast-iron certainty about the outcome.

ITALIAN AND GERMAN MORALE

The gamble came off better in Italy than in Germany in the Second World War. Marshal Badoglio has stated that the Italian collapse was due in part to the effect on the people's morale of the air attacks on Turin, Milan and Genoa. "The people realized that no plans had been made and no steps had been taken to deal with such attacks and that if the war went on all our towns and means of communication would be destroyed. Conscious of our complete helplessness, the morale of the people rapidly deteriorated."[6] The German civilians were made of sterner stuff. "The mental reaction of the German people to air attack is significant," the United States Strategic Bombing Survey stated. "Under ruthless Nazi control they showed surprising resistance to the terror and hardships of repeated air attack, to the destruction of their homes and belongings, and to the conditions under which they were forced to live. Their morale, their belief in ultimate victory or satisfactory compromise and their confidence in their leaders declined, but they continued to work efficiently as long as the physical means of production remained. The power of a police State over its people cannot be under-estimated."[7] A French authority's conclusion is this: "If, from the point of view of morale, it was expected that the massive bombardments would induce in the German population a state of apathy, preventing maintenance of the war effort, or drive them to acts of rebellion against the Nazi régime, then the bombardments failed."[8] They did not fail in so far as they deprived the German forces of supplies needed for the prosecution of the war; which means that they succeeded in so far as the aim was military and not simply moral.

WAR WORKERS' MORALE

That was only to be expected. Bombing that aims at a moral effect only is never likely to be so effective as that which embraces a military end also, if only because the latter can be concentrated; military targets are not to be found everywhere. They are, however, plentiful. The proportion of the civil population of a belligerent country that is engaged in war work is a very substantial percentage of the total population. It was 59 per cent. of the whole urban population of Germany in the middle years of the late war. If the morale of that part of the population can be weakened as a by-product of the strategic bombing of the plants and factories in which the work is being carried on, the morale of the country as a whole will suffer *pro tanto*.

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[5] S. T. Possony: *Strategic Air Power*, 1949, p. 147.
[6] Pietre Badoglio: *Italy in the Second World War*, English translation, 1948, p. 34.
[7] *Over-all Report (European War)*, p. 108.
[8] Lieutenant-Colonel P. P. C. Postel: *La Bataille Aérienne d'Allemagne*, 1947, p. 139.

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It was the morale of this part of the population which Mr. Churchill had in mind when he addressed a word of warning and advice to the German people before the heavier Allied raids began in the third year of the war. He said in his broadcast of 10th May, 1942, that we intended to bomb all the cities in which the vital industries of the German war machine were established. "The civil population of Germany," he went on, "have an easy way to escape from these severities. All they have to do is to leave the cities where munition work is being carried on, abandon their work and go out into the fields and watch the home fires burning from a distance." Again, on 19th May, 1943, he said in his address to the United States Congress: "It is the settled policy of our two staffs and war-making authorities to make it impossible for Germany to carry on any form of war industry on a large or concentrated scale, either in Germany, Italy or in the enemy-occupied countries. Wherever these centres exist or are developed they will be destroyed, and the munitions population will be dispersed."

INDISCRIMINATE BOMBING DENIED

War on morale as thus conceived does not differ greatly from the war on vital industries which the American air strategists advocated, as stated in the first paragraph of the present article.[9] War industries would be the physical objectives; the psychological effect desired would be achieved incidentally. To strike at morale in general, or that of the enemy people as a whole, and without regard to the presence or absence of a military objective in the town bombed, would be to resort to indiscriminate bombardment, and that would be contrary to the declared policy of the belligerents in both the Second and First World Wars: that is, the only great wars waged since air power emerged. A large number of solemn pronouncements on this subject could be quoted. Those made by the British and German Governments in response to President Roosevelt's appeal at the beginning of the second war are the best known; the following additional evidence may also be mentioned.

"During the entire life of the United States Strategic Air Forces I served as Chief of Staff to General Spaatz," Major-General E. P. Curtiss stated in a letter to an American military journal in 1949, "and can testify without fear of contradiction that no mission was ever sent out which did not have as its target a vital military objective."[10] The British Air Force, Sir Archibald Sinclair, the Secretary of State for Air, stated in the House of Commons on 29th April, 1942, bombed only factories, means of transport and military stores. An allegation that its attacks were indiscriminate was categorically denied by Mr. Attlee, the Deputy Prime Minister, in the House on 27th May, 1943. The German Air Force on its side claimed also that it attacked only military objectives. When Field-Marshal Albert Kesselring was being questioned at Nuremberg on 13th March, 1946, about the bombing of towns in Poland, he interrupted: "Not the towns, I emphasize, not the towns." The attacks were, he said, "on military targets: airfields, staff headquarters and traffic centres were attacked." He denied that the bombing of Warsaw, Rotterdam and Coventry were terroristic; in bomb-dropping, he pointed out, there is often a good deal of deviation.[11] The German attacks on London in the autumn of 1940 seemed to many of us who witnessed them to be

[9] A difference does remain, however. It is an abuse of terms to say, as did the manual of tactical notes prepared by No. 5 Group Headquarters in 1943, that "all bombing is precision bombing. . . . This is true even when the target is a large German city which is to be destroyed by fire." (Quoted by W. J. Lawrence, *No. 5 Bomber Group, R.A.F.*, 1951, p. 181.)

[10] Letter in *Ordnance*, May-June, 1949.

[11] *Trial of German Major War Criminals*, H.M.S.O., Part 9, pp. 25-7, 52. It is significant that the Tribunal's report was silent about Warsaw, Rotterdam and Coventry.

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indiscriminate. It is doubtful whether they were intentionally so. The official British account of the civil defence of this country in 1940-41 states that the raids were "aimed at the docks at large, at the administrative and commercial centres, at some big areas containing complicated railway systems. It may be open to question whether as a general policy he (the enemy) aimed at hospitals and public buildings, but he often hit them."[12] Practice may not have conformed to precept in all cases, but it was probably true that sheer terrorization or the indiscriminate bombing of civilians for the purpose of weakening their morale was not the deliberate policy of any of the belligerents.

THE SOVIET STANDPOINT

Where, exactly, the Soviet Union stood in this matter is not entirely clear. Since the war it has been a stock theme of Russian propaganda that while the gallant Red Air Force fought—and beat—the German Air Force, the Allies contented themselves with slaughtering civilians and destroying property in the German towns, their purpose being, it is alleged, to serve the interests of capitalism and trusts.[13] A very different attitude to terrorization as a policy was apparent in a statement which Marshal Stalin made in his talk with Mr. Churchill and Mr. Averell Harriman in August, 1942. He urged, according to Mr. Harriman's report at the time to President Roosevelt, that "homes as well as factories should be destroyed. Churchill agreed that civilian morale constituted a military objective, but that destruction of the homes of workers was only a by-product of near-misses on factories."[14] Apparently, not less but more slaughter of civilians would have been to the Russian taste then.

THE ATOMIC RAIDS

Alike in Germany and in Japan the strategic bombing offensive conducted by the Allies in the late war was largely a matter of city-burning. The United States Strategic Bombing Survey found that 75 to 80 per cent. of the urban destruction in Germany was due to fires, not to explosions,[15] and in Japan the percentage so attributable cannot have been less; by far the greater part of the destruction there was caused by the incendiary raids which started in March, 1945. The fire-raising raids were aimed in part, at least, at morale, and in so far as they were they had, on the whole, results that were disappointing to those who had nursed perhaps excessive hopes for this form of strategy. Among these was the late General Smuts. In a national broadcast from Pretoria on 4th September, 1943, he referred to the massive air offensive that was beginning against the German industrial centres. "If," he said, "German internal morale broke in 1918 when Germany was intact and had escaped all the ravages of war which she had inflicted upon her neighbours, how long will she endure a devastation worse than that of the Thirty Years War? The fortress of Europe will disappear physically before the onslaught by night and day. And its effects on civilian morale will be even more devastating than its physical effects."

Actually, as we know now, the effects on civilian morale were by no means as great as they had been expected to be. Only in Japan, and only at the eleventh hour, did the results seem to justify psychological bombardment. The atomic raids of August, 1945, were definitely aimed at morale. That fact is clear from

[12] *Front Line, 1940-41*, 1942, p. 22.

[13] See the statement by Marshal Verchinine quoted by M. Camille Rougeron in his article in *Forces Aériennes Françaises*, September, 1950, p. 667.

[14] Quoted in *The White House Papers of Harry L. Hopkins*, London, 1949, Vol. II, p. 617.

[15] *Over-all Report (European War)*, p. 93.

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the statement of Mr. H. L. Stimson, who, as Secretary of War, was the immediately responsible authority. "I felt," he has said, "that to extract a genuine surrender from the Emperor and his military advisers there must be administered a tremendous shock that would carry convincing proof of our power to destroy the Empire. . . . The atomic bomb was more than a weapon of terrible destruction; it was a psychological weapon."[16] It certainly seemed to have an immediate effect in bringing the war to an end, but whether it was the real cause of Japan's surrender is exceedingly doubtful. She could not have gone on much longer in any event. Admiral of the Fleet Viscount Cunningham of Hyndhope has written: "I think Japan would have surrendered without either invasion or the use of the atom bombs. I consider now that it was a pity and a mistake that we ever dropped them."[17] Still, it did seem at the time to have given prompt results.

It is hardly deniable that, by gate-crashing into the war at the eleventh hour, the atomic bomb gave psychological bombing a new lease of life. Such a strategy would probably have been written off as a failure if the bomb had not been dropped; it would have been criticized for failing to produce the moral effect expected of it and for producing a military result in the shape of a reduction of war production too belatedly to be of very much value. An American writer has gone so far as to assert that strategic bombing was "moribund" by the end of the war when it "unexpectedly received a revitalizing shot in the arm: the atomic bomb put it back on its feet."[18] That is an unbalanced judgment. There was more in strategic bombing than the attack on morale of which the atomic bombing was the climax. It embraced not only the raids on the cities—and some of these were militarily very profitable in reducing war production—but also those on oil and transportation targets, which were by common consent not failures in any sense; they contributed in a high degree to the Allies' victory. Still, the fact remains that the atomic raids did go some way towards rehabilitating the reputation of strategic bombing as an agency for enforcing a decision by attacking an enemy's morale.

MORALE AS AN OBJECTIVE IN FUTURE

It is hardly surprising that the events of August, 1945, should have inspired the belief, rather uncritically accepted, perhaps, that what the atomic bomb achieved against Japan then it could also achieve against the Soviet Union in a future war. War on morale came back strongly into the limelight. The advocates of it were quick to point out that if it had not fulfilled expectations during the war as a whole that was because the old-fashioned bombs had had to be used up to the last moment; the atom bomb could be used at once in a future war and the whole situation would be transformed. Material and moral effect could now be achieved with lightning rapidity and the war would be won before it was well begun. How far the new bomb will have that effect and whether it will in fact be used at all in future are questions which could not be adequately dealt with within the limits of the present article.

[16] H. L. Stimson and McGeorge Bundy: *On Active Service in Peace and War*, 1947, pp. 617, 630.

[17] *A Sailor's Odyssey*, 1951, p. 646.

[18] Marshall Andrews: *Disaster Through Air Power*, 1950, p. 7.

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THE FUTURE DEVELOPMENT OF AIR POWER

By Air Marshal Sir Robert Saundby,
K.B.E., C.B., M.C., D.F.C., A.F.C.

IN the First World War air power, as such, did not exist. The whole conduct of the war was two-dimensional, and aircraft were chained to the operations of sea and land forces. Reconnaissance, control of artillery fire and a little tactical bombing were the pattern of air operations. Some long-range air bombardment was attempted by the R.N.A.S. and later by the Independent Air Force, but this, while enough to make the older Services uneasy, was insufficient to demonstrate clearly the offensive power of aircraft.

In the Second World War the operations of aircraft fell into two distinct categories. There was the long-range strategic bombing which in Europe defeated Germany in the air, destroyed her war industries and reduced her to the point at which the Allied invasion over the sea became a feasible operation. In the Pacific, when the heavy bombers got within range of Japan, they finished off the war without any need for the traditional invasion by seaborne armies.

On the other hand, there were the "triphibious" teams of naval, land and air forces which fought the campaigns in North Africa, Italy and North-West Europe, and which in the Pacific captured the enemy bases, step by step, to bring the heavy bombers within range of Japan.

As a result of our experiences in the Second World War several schools of thought regarding the future of air power have arisen. There are those who say that air power should be concentrated in future on a decisive long-range bombardment of the enemy's vitals, and those who hold that air power can make its most decisive contribution as a member of a triphibious team. There is a third school which maintains that both functions of air power will be essential, because it will be necessary for triphibious teams to capture and hold advanced bases in order to bring the heavy bombers close enough to their objectives.

The purpose of this article is to examine briefly the existing military situation, and to suggest which of these schools of thought is likely to prove right.

It is important to study this problem now, because air power is at a critical point in its development, and if we take a wrong turning the results may be disastrous. At best we shall waste enormous sums of money and dissipate a great part of our national resources; at worse we shall invite the onset of a Third World War, in which we shall stand a very good chance of being defeated.

The great land masses of the U.S.S.R., China and their satellites are ruled by two Communist oligarchies; aggressive, ruthless, cunning and ambitious, and, so far, working in concert. Their strength lies in their huge man power, and in the possession of a vast area potentially rich in most raw materials. Their main weakness lies in the fact that their man power is relatively unskilled and uneducated, and that their wide lands are as yet largely undeveloped. The output of power available per head of the population is exceedingly low by Western standards, their communications are poor, and their oil supplies insufficient.

In these circumstances, conscious of their technological inferiority, the Communists are compelled to rely on mass. They can produce countless divisions of infantry, equipped with simple but effective weapons and transport, and they

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have made great efforts to create a considerable number of armoured divisions. They also have a large air force, but it is designed mainly for local air defence and co-operation with their land forces. Although they have a long-range bomber force, they have no war experience in its use.

They can no more match the Western Powers in the production, maintenance and use of high-grade radar and other modern equipment than we can hope to match, division for division, the teeming Asiatic hordes. The Communists must rely on mass: they have no alternative.

But the West does have an alternative; we can pit brains against brawn. Our civilization has brought to its highest pitch the development of scientific and technical knowledge, engineering skill and inventive genius. We enjoy the legacy of generations of highly trained scientists, engineers and skilled craftsmen.

The problem before us is to exploit to the full our advantages in these respects, and to create an armed force that will deter the Communists from resorting to war to gain their ends or, if war should come, will enable us to win it as quickly as possible with the least expenditure of lives and money.

Let us examine the contribution which the three Services can make to the solution of this problem.

Western sea power can in no sense seriously threaten the Soviet bloc, or even China, which are almost immune from the effects of blockade at sea. Navies could attack them only by means of aircraft carriers, which would be very risky and likely to produce insignificant results. By contrast the Western Powers, and especially Britain, are highly vulnerable to the operations of hostile sea power.

Our sea communications are vital. Without them this country would become impotent and starve, the Commonwealth and Empire would lose its cohesion, and we should be almost cut off from Canada and the United States, on whom we would have to rely extensively in war time for food and munitions.

Our sea communications can be threatened by air and underwater attack. Air attack can be dealt with by land-based air forces destroying the enemy's air power at its bases and at its sources, and by escort carriers providing local protection for convoys. Submarine attack can be dealt with by a combination of land-based air forces, escort carriers and specially equipped surface vessels.

Thus it is clear that the Western navies, although they would have no offensive role against the Communist bloc in the event of war, would have a vital defensive part to play; in conjunction with a section of Western air power allocated to this task. Their organization and equipment should, and no doubt will, be modified in future to carry out this role.

The land forces of the Western Powers, on any reasonable estimate, are certain to be vastly outnumbered by the land forces of the U.S.S.R. and China. If they are not to be swept away before a Communist onrush, we would need to have, in Western Europe alone, a force of not less than fifty divisions. Even then they would be outnumbered by three or four to one, and it is very doubtful if they could hold a defensive line in Europe. It is probable that they would be overwhelmed and encircled by the Soviet mass, and catastrophically defeated. The destruction of fifty divisions would involve so grave a loss in man power and equipment, and so terrible a moral set-back, that one may question the wisdom of attempting to carry out such a plan.

By no stretch of imagination can one visualize a Western army capable of driving back the Communists and invading their vast territory with the slightest hope of success. Napoleon and Hitler both lost their great armies in this way, and there is no reason to suppose that the fate of an Atlantic Treaty army, even if it could invade Russia, would be any different.

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The wise policy would therefore seem to be to provide in Europe no greater land forces than are needed to guard against frontier incidents, infiltration, political coups and Communist-inspired civil disorders.

But if neither our sea nor land forces could act offensively against the Soviet bloc in the event of war, could air power do so with decisive effect? If it cannot, the outlook is grim.

I believe that it can.

The technical superiority of the West would be exploited to the fullest extent by the creation of overwhelming air power. This air power must provide a contingent to operate with the Allied navies in protecting our sea communications, and a powerful air defence for the protection of our vitals—our industrial areas and key points. This defence could not guarantee immunity from damage, but it could do much, very much, to reduce the scale and spoil the accuracy of hostile attacks. There must also be a tactical force to work with such armies as the Western Powers, in their wisdom, may decide to put into the field.

But, above all, it must provide an overwhelming long-range offensive force capable of delivering immediate and crushing blows on the enemy's vitals, defeating his air forces, and seizing command of the air ocean over his territories. Once this had been done, the enemy would, in fact, have been defeated. Nothing could avert the next phase, in which this air supremacy would be exploited in such a way as to bring about, as quickly as possible, the total collapse of the enemy's war effort. This achieved, he would be forced to accept the Allies' terms.

Our experiences in the last war have inclined us to think that strategic air bombardment, like sea blockade, is slow to produce results. But in the future great bomber fleets using atom bombs might achieve decisive results in a very short time. Indeed, it might be possible to bring about the collapse of the Soviet power before their armies had consolidated their hold on Western Europe.

There remains the question of advanced bases for the use of bomber forces. It is very doubtful if these can, in future, be maintained. Geographical barriers might prevent them from being overrun by land forces, but nothing could stop the enemy from concentrating upon them, one after the other, a vast weight of air attack. No local defences could be strong enough to withstand such concentrations, and the bases would inevitably be knocked out.

The necessary range can and must be built into the bomber of the future, which will operate from its homeland. There would thus be no need for the triphibious teams of the Second World War, whose only strategic justification was the conquest of advanced air bases.

This brings us face to face with two unwelcome conclusions. First, the Soviet armies could not be prevented from overrunning Europe and, secondly, that the generally accepted doctrine of balanced forces and triphibious teams must be abandoned in favour of an absolute priority for the air forces.

I realize that few people will find either of these conclusions palatable, and I agree; but my study of this problem has convinced me that there is no other solution. It is wishful thinking of the most dangerous kind to believe that any land forces at the disposal of the Atlantic Treaty Powers could save Western Europe from being overrun, or that triphibious teams, of the pattern used successfully in the last war, could win the Third World War if it should come.

In this situation we must face facts, and it is vital that we should plan our armed forces to keep abreast of the times and make the fullest use of our scientific and technical superiority. Far-reaching and difficult decisions will have to be made, and the continued existence of the free world will depend upon the wisdom which we show now in shaping the future development of air power.

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Starting a car at Burwash Landing, by Kluane Lake

Indian cabin, Burwash Landing

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SOLO DOWN THE ALASKA HIGHWAY

By "Arcticus"

THIS is the story of a journey which ought never to have happened. It all began last summer as I was completing a tour of duty with the U.S.A.F. in Alaska. It was one of those warm, cloudless days typical of the late Alaskan summer and there were all the trout and the grayling for the taking in the ice-cold creeks about fifty miles into the mountains from Anchorage. I was impatient to be on my way with rod and line, but the "jallopy," known to friends in the Alaskan Command as the "Blue Hornet," needed a new brake cylinder. I cursed the delay as I lay under the chassis with eyes and mouth full of grit and hydraulic oil. My temper was not improved to hear a voice speaking with the nasal tones of the New Englander from Baltimore: "What are you going to do with that can of bolts when you leave Alaska?" I replied without thinking that I would drive it down the Alaska Highway. This brought ribald laughter, further disparaging remarks about the roadworthiness of the "Blue Hornet" and a wisecrack about the English idea of a joke.

This incident, however, provided the seed of an idea and the consistent refusal of friends to believe seriously that I would attempt such a foolhardy trip provided the necessary challenge. In summer some hundreds of tourists drive along the highway and trucks use it throughout the year. Why should not I make the journey? It would not be the average tourist trip, for I intended to travel alone and I could not leave Alaska until mid-November when temperatures would already be sub-zero.

THE ALASKA HIGHWAY

The Alaska Highway is something of a legend to Alaskans. If you take a look at a map you will note that practically all the roads and railways in Canada lie near the American border and run east-west across the continent. There is one major exception, a road that runs from Edmonton northwards through Canada's North-West Territories to Fairbanks, Alaska. This road is the Alaska Highway, built by American engineers to counter the threat to Alaska from the Japanese. It passes through some of the world's most desolate and least-known country.

The idea of a highway to the North had received attention on and off for many years, even as far back as 1897; but it was not until March, 1942, that construction was actually begun. A large army of men, impelled by the urgency of war and aided by vast quantities of road-building equipment, bulldozers and earth-movers, completed the pioneer road in nine months. It begins at Dawson Creek, a tiny prairie trading post, and runs through the old-established Hudson Bay Company's trading posts at Fort St. John, Fort Nelson, Lower Post and on to Whitehorse and Fairbanks. It is 1,523 miles long from Dawson Creek to Fairbanks and 1,654 miles from Dawson Creek to Anchorage; the road I would have to take. It is now an all-year-round highway with a twenty-six-foot carriageway of graded gravel, with fine steel bridges over all the larger rivers and safe wooden ones over the smaller streams.

THE PLAN FOR THE JOURNEY

Having decided in the face of friendly advice that this was to be the way that I would leave Alaska, I had now to begin some detailed planning. I had spent

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two winters in the extreme climate of the sub-Arctic and had some acquaintance with the problems I might have to face. I knew how rough a gravel road could be, and I had experienced all the inconveniences caused by the long distances between gas stations and the even greater distances between ill-equipped repair facilities. I knew, too, how cold and even dangerous the sub-zero weather could be, and how difficult and sometimes impossible it was to start a car that had been exposed overnight to such temperatures. There would be the need to provide equipment to mitigate, until help came by, the dangers of frostbite and exposure if the car broke down in an isolated place. I bought a guide book, primarily to get a suitable map, but the book itself proved interesting; for instance, here is a pleasant passage: "Extreme cold may render travel (i.e., along the highway) very uncomfortable or even dangerous during the period November 15th to March 1st. Temperatures of 60 to 70 degrees below zero are not uncommon," and I was planning to leave on November 15th. Here is another piece of advice from the same source: "Down-filled sleeping bags are a good insurance in case of mechanical breakdown on the road. It is unnecessary to bring along gas and oil, but extra sparking plugs, fan belt, two spare tyres, etc., are indispensable. Spare parts are not always available and to have them shipped entails considerable delay and expense."

By the end of October I had accumulated what I thought would be adequate equipment and extras for the journey; these included a sleeping bag, Parka, plenty of thick socks and underwear, gloves, overshoes and a small petrol stove. I had also a multitude of spares, snow shovel, chains and alcohol. The alcohol was included not for my own consumption but to free fuel lines from ice—a most necessary precaution in sub-zero temperatures and one which saved several anxious moments.

THE ROUTE

The route was quite straightforward; there was, in fact, no alternative. My ultimate destination was Washington, D.C., 5,000 miles away, but the first 2,000 miles would be the great test, for from Edmonton the journey would be on roads that were paved and where towns and service stations would not be far apart.

I knew the first part of the road from Anchorage quite well, as I had, on three previous occasions, travelled it. But from Gulkana, 140 miles along the road, I would be breaking new ground to Tok Junction, where the Anchorage road joined the Alaska Highway. From Tok the way lay through Whitehorse, Fort Nelson and Fort St. John to Dawson Creek, then over Canadian provincial roads to Edmonton, a total distance of 2,100 miles.

I had to sail from New York on the morning of 5th December and had to arrive in Washington on 30th November. As I could not leave Anchorage until approximately November 15th I had fifteen days to do the 5,000 miles, with nearly half that distance under extreme conditions. I would need to average 350 miles per day, but I felt that this should be possible, especially as I had found from previous journeys that one could average 500 miles in the U.S. without undue strain.

FINAL PREPARATIONS

By 12th November the car had been completely serviced; such items as the brakes had been checked and the motor tuned. Of course, since the Arctic winter begins early, the car had already been fully winterized. This routine winterization involved replacing ordinary oil with special light-weight variety, greasing with special grades of grease, and filling the radiator with enough glycol anti-freeze for operation in any temperature. Finally all equipment had to be checked and stowed and farewells made.

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THE JOURNEY BEGINS

The 14th November dawned bright and cold and at about 8 a.m., as soon as it was daylight, I set out. There was an elated feeling of adventure ahead, but disaster almost overtook me before I had gone five miles. The weather had been unusual and a few days previously a warm chinook wind had brought rain, leaving a thick layer of ice on the frozen roads. Suddenly the car struck a ridge of ice and I found it completely out of control. Luckily in spite of describing two complete circles it stayed on the road and, a much-chastened driver, I carried on more cautiously. Once in the mountains beyond Palmer the road improved in condition and I bowled along, up the famous Matanuska Valley, past the many creeks where trout had been such good fishing and such delicious eating last summer, to Summit, where the road climbs to 3,325 feet and the stupendous peaks of Mounts Sandford, Drum and Wrangell, rising to some 16,000 feet, made an unforgettable scene in the early sunset. Equally unforgettable was the road beyond Gulkana; for more than twenty miles it was appalling. The deep, unploughed snow had been churned by heavy trucks into deep ruts and high ridges, and for long periods ten miles an hour seemed too fast.

It was dark when I pulled into Duffy's Tavern for gas, and as I settled before a big barrel-stove and enjoyed the pleasure of warmth and relaxation, I decided to go no farther that day. I had travelled 260 miles. The inn was comfortable if slightly primitive, and Duffy, a Canadian, was a fine old man who had spent many years in the backwoods and had some interesting stories of this isolated part of Alaska. Then the talk was of the "road" and so it was at all the inns and lodges on the road. The first question usually asked where you had come from and then how the road conditions had been. In fact, as I later found out, you could not move along the road without everyone knowing all your business. With a final warning from a trucking team about the icy patches on the narrow, winding road ahead beyond Mentasta, I enjoyed a good moose steak and retired to bed.

THE SECOND DAY

The next morning the temperature was 10° below zero, and much to my surprise the car, which had been left outside all night, started immediately. Once I was snugly inside the car, with the heater working at maximum output, the first few miles of the road passed quickly and the mountains ahead were pink in the morning sun. Then the road narrowed and began to wind steeply up through the Mentasta Mountains. It was an unfenced road that held tightly to the mountainside, with a steep cliff falling away sheer to the valley below. It was just at this time, as I was attempting to negotiate a particularly tortuous section, that the brakes failed completely without warning and the car skidded suddenly on one of the steep corners. The end came, fortunately, with the rear of the car wedged firmly in the deep snow-bank on the mountainside and a 500-foot drop on the other side. The snow shovel proved its worth here, for certainly I would have remained there for a long time before help could have been obtained. Half an hour of steady digging and the car once more stood on the road. A rapid diagnosis showed that the hydraulic fluid had leaked away; luckily the reserve supply in my emergency equipment provided a quick remedy and the journey was resumed uneventfully to the customs post at Tok Junction.

At the customs post the inspector was most courteous. All that he required to see was the certificate of ownership of the car, and after a delicious steak lunch at Tok Lodge, eaten in brilliant sunshine with the temperature only 15° below zero, I set out along the Alaska Highway itself, a broad, straight, smooth ribbon of road hard-packed with snow. The milepost read 1,318 miles to Dawson Creek.

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This smooth surface was not to last, as I realized some hundred miles farther on when I came to the Canadian customs post just as the early Arctic night was falling.

From here the road was in very bad condition, narrow and winding, pitted with deep potholes; it was dark and moonless, and the temperature got lower with each mile. The small heater in the car was totally inadequate and even in my Parka I was uncomfortably cold. I had put on thick woollen socks, overshoes and thick mittens, and my breath froze on the windscreen until there was but a small and restricted area through which I watched the road ahead. I thought of the lines of Robert Service from "The Shooting of Dan McGrew":

"Were you ever out in the Great Alone, when the moon was awful clear,
And the icy mountains hemmed you in with a silence you 'most could hear;
With only the howl of the timber wolf, as you tramped there in the cold,
A half-dead thing in the stark, dead world?"

All that was needed was the howl of the timber wolf. Then out of the darkness appeared Dry Creek Lodge; I decided to stay. They offered a heated garage which I gladly accepted—the temperature was by now 30° below zero—and I knew from past experience that no car would start in such temperatures without adequate preheating. The car was safely stowed and I retired to thaw out my stiffened joints before a huge wood fire and to think about the moose steak that I would soon be eating.

THE FIRST DELAY

I prepared for an early start and went out to the log shack that served as a garage, expecting to drive away, but the pot-bellied stove was cold and the temperature inside the shack was as low as that outside. Annoyed at this delay, I complained to the owner, who said that his Indian garage hand had been paid that day and had promptly spent his wages in the tavern and had, as usual, become completely incapable. With the aid of another motorist, the fire was lit and slowly the shack warmed up, but at such low temperatures—it was then 40 below—the oil is like vaseline and the engine takes a long time to reach a temperature at which it can be started. By one o'clock I was able to leave, but the unfortunates who had had to leave their vehicles outdoors were still there, for not only had their engines frozen but even the transmissions were immovable.

FURTHER TROUBLE AND DELAY

The plan was not going as I would have wished, and there had to be some revision. It grew dark at 3.30 p.m. and to make up for lost time I decided to carry on and drive during the night. So I pressed on, driving through some beautiful country, mountains with jagged peaks sawing the sky and the deep snow stained red in the late afternoon sun. But troubles were not over; the generator suddenly failed and the lights immediately became dim, since in those low temperatures the battery was only about 40 per cent. efficient. A quick look at the map showed Burwash Landing just ahead and also a repair shop. The repair shop was closed when I arrived, so that all that could be done was to wait impatiently until morning. There was no warm storage for the car and I prepared for a long delay, since at eight o'clock that evening, when I sought the comfort of Kluane Lake Lodge, the temperature was already so low that the mercury could not be seen in the tube. The morning came fine but terribly cold (- 50° F.) and there was work to do. First I removed the generator—this was quite a problem in the open with no heat—in fact, I froze three fingers, which proved very painful, and they did not recover properly for some weeks.

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While the garage repaired the generator and recharged the battery I took pictures of other motorists attempting to start their cars until the shutter of the camera froze. The usual procedure was to hook a car by its front bumper to a truck and tow it, sliding and skidding over the snow until the transmission slowly loosened and the engine could be turned. By noon the generator was pronounced serviceable.

There was need for haste. I had been three days on the road and had travelled only 660 miles; there was a long way yet to go. I left Kluane Lake for Whitehorse and here for long distances the road was good with the snow packed to a hard, smooth surface and forty to fifty miles an hour could be made with ease and safety. By 7 p.m. I was in Whitehorse; it was not so cold, so I decided to carry on. I had left Whitehorse only an hour when the generator failed again. The question was whether to go on or turn back to Whitehorse. I decided to go on to the next lodge, where repair facilities were alleged to be available. The last ten miles were quite a nightmare. I did not know the mountain road, there was no moon and I had no lights, since the battery was only sufficient to keep the motor running. It was really the last straw to discover that the inn did not do repairs. My morale was at a low ebb, but the sight of real Canadian hospitality and good food banished all thought of the problem until morning.

The following morning was quite mild (about 0° F.). The battery appeared to have recovered somewhat and so I decided to go the short way to Teslin. The worst happened when I had four miles still to go to reach Teslin. The engine finally died and I was stranded; the most dismal prophecies of my friends had come true. There was nothing for it but to lock the car and walk to Teslin. Once again I was glad of the protection of proper Arctic clothing. In Teslin, Harry Rachel, the garage owner, promised to fix the generator, and his brother and I towed the car to the garage. I discovered that to be towed behind a lorry at 20 miles an hour over mountain roads covered with snow and ice is more exciting than any Big Dipper.

He had parts available but could not finish the job until the next day, so he took me along to visit the nearby R.C.A.F. detachment, and I shall long remember the hospitality of their Saturday evening social.

THE JOURNEY IS RESUMED

The next day brought me to Coal River Lodge; I had driven 270 miles that day and a rest was welcome. The bottom had already fallen out of the thermometer and there was no warm storage. I adopted an old trick often used in the North: I ran the car every three hours during the night to prevent freezing. It was a wise precaution, for, in spite of the 55° below zero weather, the car started and I was the only traveller to leave. Even a truck driver who had taken elaborate steps to avoid trouble by rigging up a tent and placing two heaters under the sump failed to get away.

That day was the most exhilarating of the whole trip. The scenery was magnificent. The road ran past lakes smoothly frozen and glistening in the winter sun; it ran, too, alongside swift rivers only half-frozen, with a fog of gleaming ice crystals hanging over the open water; and all the way, high, jagged mountains covered with spruce and pine. Although the road condition was good, the brilliant sun on the snow, combined with some rather tricky hairpin bends, made driving rather arduous. Late that afternoon snow began to fall and by the time I had reached "Lum and Abner's," which the guide book aptly describes as "a colorful and authentic North country trading post," it was snowing so thickly that I thought it better to wait until morning.

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Sheep Mountain

Here there were an oddly assorted gang of oilmen who were soon joined by a parson whom I recalled having seen in Anchorage. I was curious to know why he should be here. He had been to the United States to collect church furniture and was driving the whole consignment back to Anchorage unaided. His story of conditions beyond Dawson Creek was depressing: the road was apparently all but impassable, and events showed that he had not exaggerated.

THE LODGES ON THE HIGHWAY

The accommodation at Lum and Abner's was good and the meal of roast beef and vegetables excellent. I had by this time grown accustomed to the rough-and-ready standards that must be accepted along the highway. There is something quite distinctive about the lodges and trading posts. Most of them are log cabins with huge, open fires or pot-bellied stoves and an atmosphere that one associates with Fenimore Cooper. The accommodation is generally primitive but clean, the food plain but generous, and the welcome one that could not be bettered anywhere. Many of the owners are real old pioneers, the advance guard of others who will open up the rich country in the future.

THE HIGHWAY ENDS

That night brought a heavy fall of snow which the maintenance crews had had no time to clear when I started the next morning. Fortunately everything went well and I had no need for chains in spite of six inches of fresh snow and even deeper drifts. The long climb up Trutch Mountain was rewarded by a magnificent view of the surrounding country; and so to Fort St. John over the splendid Peace River bridge to Dawson Creek and the official end of the Alaska Highway. It was dark as I arrived, but I felt the need for celebration and fortification against the road ahead. I sought out the best hotel the settlement could offer and will not quickly forget the enormous steak and delicious Canadian beer.

Two days later I was in Edmonton. The parson had indeed accurately described the road from Dawson Creek as wellnigh impassable; it was the worst

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part of the whole trip. The road was deep in soft snow with only a single track deeply rutted and heavily potholed; so narrow that in passing the occasional heavy truck there was constant danger of running off into impossibly deep snowdrifts. To make it even more unpleasant, bad gas at Dawson had filled the fuel lines with ice, but the alcohol I carried saved any delay.

My plan to drive down the Alaska Highway in mid-winter had been accomplished; it had been a unique experience. The hazards and difficulties of driving alone over a strange, snow-covered road, frequently at night, had been great and the weather a very severe test of an old vehicle; but there was a sense of achievement and the scenery had been some of the most magnificent anywhere in the world. The road itself is a truly remarkable engineering feat and it is impossible to forget the great steel bridges that span the great rivers, the Tanana, the Liard and the Peace. The road surface, though gravel, is generally good, and great efforts are being made to improve it during the comparatively short construction seasons; the Canadian Army authorities do a fine job of maintenance under the rigorous conditions of the northern winter. I have tasted the hazards and discomforts of winter travel and now my one desire is to have the opportunity to travel north along the Highway in summer to enjoy the fishing that this area provides in such rich abundance.

NOTICE TO CONTRIBUTORS

It is requested that contributors will ensure that all typescripts of articles for the January, 1952, number reach the Editor by 1st November, 1951

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[Air Ministry Photo

AN R.A.F. REGIMENT WING, CONSISTING OF SQUADRONS OF ARMOURED CARS AND RIFLE SQUADRONS, CARRIES OUT TRAINING

Advancing through the forest both rifle and armoured car squadrons work together

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GROUND DEFENCE OF ROYAL AIR FORCE INSTALLATIONS—ITS INCREASED IMPORTANCE

By Air Vice-Marshal S. C. Strafford, C.B., C.B.E., D.F.C.
Commandant-General, Royal Air Force Regiment

INTRODUCTION

In weighing the importance of adequate measures for the ground defence of Royal Air Force installations at the present time, it is necessary to envisage the probable conditions of a future war.

A Continental power with a large standing army available on the touchline, unlimited man power, absolute and centralized direction and unimpeded initiative, could start a war at a time and place most convenient to its own plans. It could thus launch the main land offensive with great advantages.

A numerically superior air force is available to support its army and, at the same time, to assist the maritime war against our vital sea communications, and pursue the air war against our home bases and war potential generally.

With full confidence in his ample resources and experience in land warfare, and his ability to ensure that the front line is pushed increasingly farther from his frontier, the enemy is likely to be the more sensitive to the possibilities of air attack behind his front line, and on vital centres within his own frontier. Appreciating the complexity of the problem of providing an effective air defence organization over the vast area involved, he will concentrate on an attempt to defeat this threat at its source. Attacks on Allied airfields and air installations, in the order of priority of their direct menace to his own plans, are therefore to be expected from the outset.

THE METHOD OF ATTACK

These attacks may take the form of high or low-level bombing, or low-level rocket attacks. Such attacks on dispersed aircraft and vital points would entail a disproportionate operational effort to be entirely effective. But the enemy has at hand all the means for an alternative which would not entail the diversion of his main bomber force from key strategic targets. He could drop, at low level, parties of highly trained and determined airborne troops on each selected airfield or ancillary installation. In overseas theatres air installations will additionally be vulnerable to attack by small motorized forces infiltrating through the main defences, on the lines so successfully exploited by our own special service troops in the last war.

It is already the confirmed policy, based on careful analysis of the lessons of the last war, that the Royal Air Force is responsible for the local ground defence of its airfields, installations and ancillary units, and that ground combat training is an essential part of the training of all combatant personnel of the Royal Air Force. The increased probability of attack, and on a scale greater than previously experienced or anticipated, adds a note of urgency and emphasis to the task of implementing this policy.

INCREASED COST OF EQUIPMENT AND INSTALLATIONS

Another factor which increases the importance of ground defence in the Royal Air Force is that modern aircraft and equipment are increasingly complex and

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[*Air Ministry Photo*

An R.A.F. Regiment training flight have lunch in the woods

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expensive, both in regard to initial supply and to maintenance. As an example, the modern four-engined jet bomber will cost not less than a million pounds. Considered in terms of raw materials and production effort the cost is even more formidable and restrictive of the number that can be made available. Modern weapons, and increased performance, will greatly multiply the offensive power of each aircraft. The destruction of one of these aircraft on the ground will thus represent a loss to the Allied war effort out of all proportion to that of, say, the loss of a Lancaster in the last war.

THE STRAIN ON NATIONAL MAN POWER

Shortage of man power has always been one of the major limiting factors in the war potential of the United Kingdom and the Commonwealth. It is now more important than ever to observe stringent economy in the allocation and employment of available man power.

In addition to the military and Civil Defence measures to meet the threat of air attack, with all that is involved in the development of new and powerful weapons, a considerable land and air contribution must be made to N.A.T.O. forces for Continental defence. At the same time the problems of defending the Middle East base do not diminish, and the Far East—including Malaya—will absorb land and air forces for some time to come. A contribution to the United Nations Forces in Korea, or other fringe area of disturbance, may also be a protracted commitment. The maritime war, including the defence of our sea communications, has always a high priority claim on our total resources for naval and air forces.

While these mainly defensive measures on sea, land and in the air are being provided offensive hitting power must also be built up by the provision of the long-range bomber force, our only means of hitting quickly and directly at the enemy's vitals.

All the above will require an ever-increasing broadening of the foundation of our war economy in increased industrial production and agricultural development. It is clear, therefore, that no overlapping in the use of available man power can be tolerated.

ROYAL AIR FORCE MAN-POWER PROBLEMS

The operation and maintenance of a modern air force presents an increasingly complex problem in the training and utilization of man power. In the higher skilled trades aptitude and lengthy training is essential. Shortages in a particular trade have a direct bearing on operational output. It is obvious, therefore, that avoidable diversion of the effort of skilled personnel from their primary task must be eliminated. In the weekly routine of a service station diversions inevitably occur, and "economy" in available domestic transport increases the time spent on a large station in going to and from pay parades, kit issues and inspections, medical inspections and educational classes. Inter-unit sports and athletics, competition target shooting and similar activities, and travelling connected therewith, absorb spare time. These activities are important to morale and *esprit de corps* and are accepted valuable features and attractions to service life. The station commander's constant problem is to find time and to resolve conflicting claims on time. As pressure increases in periods of tension, expansion and emergency it is more and more a question of deciding what is essential and what is desirable. Priorities and effort must then be adjusted accordingly.

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ROYAL AIR FORCE ESSENTIALS

An air force exists for one reason, and one reason only—the effective and economical prosecution of the air war. Air operations cannot, however, be conducted from insecure bases and the operation of a modern air force is increasingly a question of team work both in the air and on the ground. A high and consistent standard of professional efficiency is essential in both aircrew and ground personnel members of the team. A high level of maintenance effort is necessary to provide aircrew with the maximum flying hours for productive all-weather flying training or for operations. A high level of technical efficiency is necessary on the ground, both to run the base efficiently to produce this maintenance effort, and to reduce to a minimum its vulnerability to attack. If this latter requirement in any way conflicts with the former is there no alternative solution? There is. It would be to accept that all Royal Air Force ground personnel should be uniformed technicians relying entirely upon the Army, both at home and overseas, for their ground defence. Experience has shown that this would not be effective, practicable or economical. It would result in an intolerable waste of man power which would prejudice the total war effort and the ability of the Army to fulfil its primary task, which includes the ground defence of territory from which the Air Force operates. The Royal Air Force has a large cut of national man power and it is immediately available in large numbers at the places liable to attack. There can be no doubt, therefore, that the agreed inter-Service policy on this question is right. The Royal Air Force is, and must be, responsible for the local ground defence of its own installations. An important Royal Air Force essential is, therefore, that all its combatant personnel must maintain an adequate standard of training in ground combat.

ACHIEVING AND MAINTAINING THE REQUIRED STANDARD

The required standard of proficiency in ground defence can be attained and maintained without undue diversion from the primary role of the Royal Air Force. Station combatant personnel are not required to be trained to the standard essential for mobile operations in the field. The requirement is for the deliberate defence of a static or semi-static base, and for which the bulk of the defenders must be in prepared positions and capable of producing a volume of controlled fire power.

The young officer and young recruit receive basic training in ground combat during initial training on entry. Thereafter all combatant personnel, officers, N.C.Os. and airmen, are required to do enough annual individual training to enable them to pass the required minimum standard test each year. In addition, collective training, including periodical practising of station defence schemes, is carried out as directed by commanders-in-chief.

This training is also a most valuable means of developing other essentials to an air force, namely, physical fitness, alertness, man management and able leadership. The opportunities afforded in the latter connection will be in direct proportion to the extent to which officers and N.C.Os. instruct their own men in ground combat and do not rely on specialist instructors. Man power restrictions will in any case strictly limit the extent to which specialist instructors can be made available for other than basic instruction.

GROUND DEFENCE SPECIALISTS

The employment of station combatant personnel in deliberate defence is practicable and efficient providing that at the most vulnerable stations a nucleus

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of ground fighters is available to undertake certain full-time tasks. These include the provision of warning screens—so that technical personnel may remain at normal work until the last possible moment—of forces for counter-attack, and other duties requiring proficiency in manœuvre. These specialists are provided by the Royal Air Force Regiment. The Royal Air Force Regiment also provides light anti-aircraft squadrons for the defence of certain airfields overseas. Additionally, from the Royal Air Force Regiment are drawn staff officers and instructors.

The Royal Air Force Regiment, as organized, represents the maximum hitting power *per capita*, as it lives on the main structure of the Royal Air Force and has no separate administrative tail. In certain overseas theatres British man power is saved by the employment of locally enlisted personnel—The Royal Air Force Levies (Iraq), the Aden Protectorate Levies, and the R.A.F. Regiment (Malaya) are examples of this policy, which has been more than justified by experience in the field.

CONCLUSIONS

The operational potential of an air force can be seriously reduced by attacks on its bases and installations. Air force personnel are immediately available for, and capable of, providing the bulk of the forces for local ground defence and can be trained for the purpose without undue diversion from their primary role.

Within the limit of available resources the R.A.F. Regiment supplies the necessary nucleus of specialist ground fighting units, staff officers and instructors.

The primary task of the Royal Air Force is the effective prosecution of the air war. This cannot be achieved at maximum potential if its bases can be neutralized by enemy infiltration. Ground defence training should therefore be conducted with enthusiasm and efficiency only second to that devoted to keeping the aircraft flying.

AIR VICE-MARSHAL S. C. STRAFFORD, C.B., C.B.E., D.F.C.
Commandant-General of the Royal Air Force Regiment

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[Air Ministry Photo

Fitness is an essential qualification, particularly ***for flying duties***

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SELECTION FOR CRANWELL

By Squadron Leader F. D. S. Scott Malden, D.S.O., D.F.C., R.A.F.

INTRODUCTION

NO subject arouses more controversy than the selection of Regular officers. Raise the topic in a Service Mess, and you will soon discover that there are any number of officers who "know officer material when they see it." They have been handling men all their lives, and if they don't know how to pick 'em by now, who does? This serene self-confidence carries a measure of conviction. Indeed, it is easy to become hypnotized by it. But the impartial inquirer, who presses to discover the criteria by which such selection is made, will find to his dismay that they differ in each case according to the background, experience and prejudices of the officer concerned. Cæsar's criterion was at least simple:

> "Let me have men about me that are fat,
> Sleek-headed men, and such as sleep o' nights:
> Yon Cassius hath a lean and hungry look . . ."

Yet it was scarcely a fair judgment of Cassius's ability as an officer.

Corpulence is not a common standard of selection, but there are some which emerge inevitably in a discussion of this subject, sometimes openly, more often with an apologetic "You can say what you like, but it's still the only thing that matters." The most frequent are: Public school education, breeding, athletics, and even good looks. It was chiefly dissatisfaction with such standards, from the aspects of both common justice and results, that led to the experiments in selection technique made during and since the war. The purpose of this article is to discuss the problem of selection and the new technique adopted by the R.A.F. Selection Board, and to decide whether the final answer has yet been given to the problem.

THE POLITICAL FACTOR

It is probable that dissatisfaction with pre-war methods would, in any case, have led to experiments designed to produce a more reliable method of selection. The Army was alarmed by the weaknesses in their junior officers revealed under pressure of war, and they called in the help of psychologists to develop the now familiar pattern of the W.O.S.B. But the experiments were fostered by the changing climate of political opinion.

The social revolution in this country, with its emphasis on equality of opportunity and elimination of privilege, made the old method of selection by interview politically unacceptable. The concept of an officer class, drawn from a definite social stratum and educated at the independent schools, has been replaced by the idea of an officer corps, drawn from any stratum of society, and selected purely on the basis of intelligence and ability. In the present political atmosphere, not only must this concept of "officer material" be revised, but the selection methods must also be free of any suspicion of bias or nepotism. To borrow a phrase from the Law, not only must justice be done, but it must be manifestly seen to be done.

This political directive is not easy for the military to accept. It is true that the Royal Air Force has always been to some extent an "All Ranks Service"—and proud of it. But it raises special problems in connection with the Cranwell training. Under the old system, much of the officer training was already done at the public school. The corporate life, with its insistence on responsibility and the team spirit, had already laid the foundations on which Cranwell could build.

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Moreover, it is false to think of the officer's function as merely to excel his men in intelligence and ability. Much of his effectiveness comes from comradeship and team work, which is the whole reason for the elaborate system of Mess life and tradition in the Service. If a lot of individuals, however great their intelligence and ability, are lumped together without any more experience of corporate life than is provided by the State secondary schools, a longer and more careful training is likely to be needed at Cranwell to achieve the desired result. However, the political factor is here to stay, and it is the responsibility of the Service to modify its training and selection methods accordingly.

THE PROBLEM OF SELECTION

Our raw material, then, is a varied cross-section of the country's youth, with widely differing background and education. The task is to select the most suitable to fill the forty or fifty vacancies per term offered at Cranwell. If we examine this task we find it to be three-fold: Firstly, to make an accurate assessment of each candidate's intelligence, character and ability; secondly, to project him into the future and decide whether he is suitable for training as a permanent officer; and thirdly, if the number of suitable candidates exceeds the number of vacancies, to grade them in order of merit to decide which shall take up the vacancies offered.

In the pre-war system of competitive written examination and interviews, these processes were blurred. The written examination revealed something of the candidate's intelligence, general knowledge and powers of reasoning and expression, but it was mainly used as a competitive test for the grading process. The war, in particular, showed up the weakness of the written examination as a criterion for the selection of officers, and a strong feeling grew up within the Services that whereas it might be suitable as a means of grading for certain professions, such as accountancy, it was not the answer for grading the potential officer. This does not, however, rule out its usefulness for setting a minimum standard.

Selection boards were given no guidance as to the qualities to look for, and so each board had its own ideas of officer qualities and standards.

The interview, which was used to supplement the written examination, was so short that only a general impression of the candidate could be gained, and here again the three processes were hopelessly blurred. In addition, it was wide open to the charge of prejudice and bias according to the personal tastes or background of the interviewing officers.

It is now generally recognized that no reliable estimate of character can be obtained by such means; and even if it could, the political directive would not be satisfied.

THE FIRST STAGE—ANALYSIS

The first stage in selection, then, is to devise the best possible means for making an accurate analysis of the candidate's intelligence, character and ability. It is here that the new so-called "psychological methods" make their main contribution to the problem—not only by providing new and more scientific methods of analysis, but also by exposing the faults and prejudices inherent in the old.

The new methods, generally referred to as "Country House Selection," and practised by the R.A.F. Selection Board at Ramridge House, are too well known to need detailed description, but there are some features which are often misunderstood and must be placed in their correct perspective. In the analysis stage, they simply provide a means of assessing the candidate's present capacity,

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and as such are merely a more scientific extension of the old method of written examination and interview. His intelligence is assessed by means of certain intelligence tests which have a very wide circulation in schools and other fields of selection, and which give an intelligence rating which has been proved surprisingly accurate by the follow-up work done at Cranwell and elsewhere. His general knowledge and academic ability are assessed by means of written tests, which again are widely used for similar purposes elsewhere. His character is assessed by means of an interview, with the difference that in this case the interview is spread over three days. This is the significance of the so-called "Leaderless Groups" and "Command Situations" which are so frequently misunderstood. They are not a series of indoor and outdoor "tests" which candidates must pass or fail. Viewed as such, they become merely ludicrous, since they bear no relation to a R.A.F. officer's work, and in any case the whole theory of setting "tests" in one context to prove ability in another is quite unsound. The explanation of them is quite simple. It is impossible to "interview" in the normal sense for a period of three days. Yet some such period is necessary for a board to overcome its first impressions of a candidate and see him as he really is. The only practical method is to let him engage during the three days in occupations suitable to his age-group and interests, in the hope that he will gradually forget that he is being "tested," and his character will be revealed by his reactions to his fellows, and vice versa, and the way he tackles each task. In the writer's opinion, an experienced member of the board can build up over three days a comprehensive picture of character and ability, except only for integrity and moral principles, which are the hardest of all to assess. This picture is expressed as a "Profile," of which the pattern is attached as an appendix. In fact, it cannot be used as a certificate of success or failure, as we shall see later on, but it serves a most useful purpose as a "check list" for the interviewing officers, to make sure that they have scrutinized every facet of a candidate, and it cannot be denied that the completed profile presents a far more accurate and comprehensive analysis of intelligence, character and ability than has ever been achieved in the past.

THE SECOND STAGE—PROJECTION

The picture is drawn. The "Profile" is complete. The question remains: Will the individual so carefully analysed here be suitable for training as a permanent R.A.F. officer? Does the lack of this or that quality disqualify him? Does his immaturity hide qualities of great value?

> "Some village PORTAL here may quake and quail,
> Some SLESSOR, offspring of the local squire;
> Some mute, inglorious TEDDER here may fail,
> Some HARRIS, guiltless of the Hamburg fire . . ."

It is the custom in the Services—particularly at Staff Colleges—to write articles on leadership in which various qualities are listed which the potential leader must have. Unfortunately the qualities are many, and few officers have them all. It is never stated to what degree a potential officer must have them in order to follow a normal Service career, and it may seem that to the selector, as to the evil generation in another context, no sign shall be given. He will have to rely, as in the past, on the "collective, practical wisdom of the Service," and set standards in his own mind accordingly. But there is one line of approach which tends to confirm that the "Profile" in use at the R.A.F. Selection Board is at least on the right lines.

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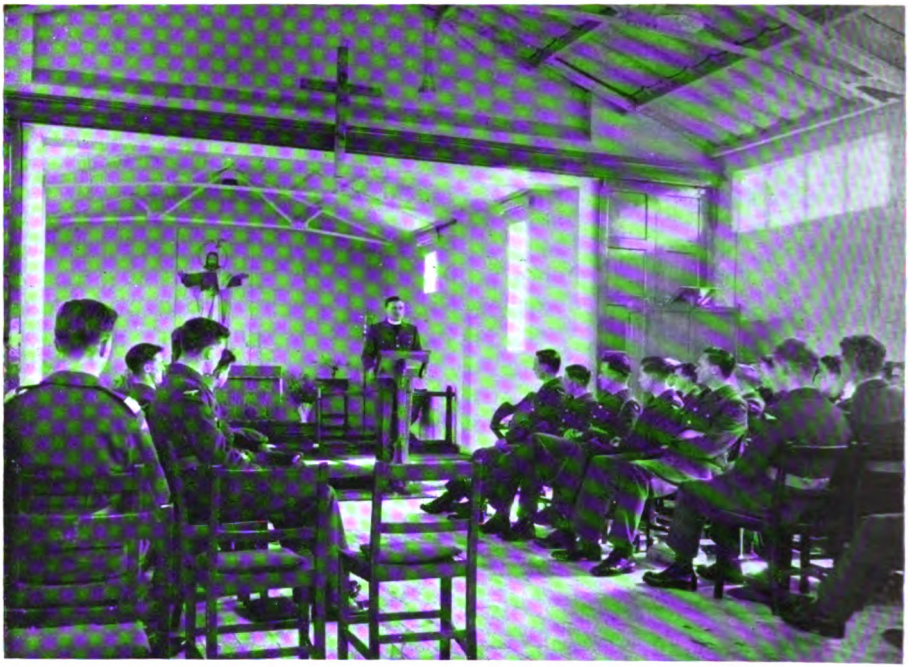

[Air Ministry Photo

An informal talk by the Chaplain

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A cross-country map-reading group

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There is a technique widely practised in industry called "Job Analysis." It is based on the simple theory that if you want to assess suitability for a job, you should break down the job into its essentials and see exactly what skill or intelligence is needed for each component part. This technique played a valuable part in sorting "round pegs into round holes" and organizing the most economical use of man power in war time.

The application of this technique to officer selection is not exact, but it is the main contribution that psychological methods can make to this stage of the selection process. The R.A.F. officer's job can be divided broadly into three aspects: Firstly, the specialist activities of his particular branch, i.e., flying, technical, accountancy, etc.; secondly, administration, which comprises the command of men and organization of units; and thirdly, staff work. The normal Regular officer's career involves these three aspects in roughly equal proportions, and it can be considered essential that the Cranwell cadet, whatever rank he is ultimately expected to reach, should be reasonably proficient in all three spheres.

Since the greater part of the Cranwell training is for the general duties officer, this branch only will be considered here. There are two requirements: Firstly, the basic skill—the co-ordination of hand and eye—necessary to make a good pilot; and secondly, the qualities necessary to make a good operational pilot and formation leader. The first requirement has been very carefully studied, and "flying aptitude" tests have now been instituted as a preliminary sieve through which all candidates must pass. Results so far show that they help to eliminate wastage during training, but, wisely, they are not used as a final arbiter for the rejection of otherwise suitable candidates. The qualities required for a good operational pilot are far more controversial. Operational commanders in the last war, as well as the general public, were continually amazed by the emergence as outstanding operational pilots of the most unlikely types of men. How often was the typical Service officer of the old type—the hearty, rugger-playing public schoolboy—found wanting as an operational leader, while weedy, sensitive, unathletic individuals emerged as outstanding leaders in battle. A great deal of medical research was done on "Lack of Moral Fibre," which is a subject in itself, but the broad conclusion was that the most important single aspect in this matter was "Motivation," the basic incentive which drives a man on, which keeps him flying when others would turn back, and which enables him to overcome weaknesses or handicaps in other directions which might have detracted from his effectiveness as an officer. Hence the importance attached to "Motivation" in the "Profile." It varies with different individuals: Can it be forecast in the immature youth? Do his incentives at the age of seventeen bear any relation to the incentives which will make him a valuable operational pilot in five years' time? At best only a guess can be made, based on the strength of his convictions about the interests which absorb him at the time, and the determination with which he has pursued them at school and elsewhere.

This is the central problem of this part of the officer's job, but there are also certain minimum standards which must be set at this stage. The candidate must have the basic intelligence and academic ability to absorb the training in his trade, e.g., the mathematics needed for navigation. He must have a suitable medical category for flying duties in all parts of the world. These minimum standards can fairly be set by the Service authorities, and here the written examination and normal medical board can be used without risk of criticism.

We can pass, then, to the second sphere of activity—administration. So much has been written in the past of the qualities of a successful commander that these

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need not be retold here. They can all be found in the "Profile," and they all emerge from a careful analysis of the day-to-day work of an officer when engaged in the command of men and organization of units. It is worth noting that athletic ability, so often worshipped as an end in itself, here assumes its rightful place as a useful attribute in organizing the life of a Service unit, where sport of all kinds plays an important part in morale and well-being.

The third sphere, staff work, demands primarily logical reasoning and power of expression. Here again it is fair to set a minimum standard by means of a written examination, since a boy who has not attained a reasonable standard by the time he leaves school is unlikely to acquire enough proficiency in later years to make an adequate staff officer. Staff work also demands loyalty as much as the other two spheres of activity, but in this we have an example of one of the nebulous qualities which are most difficult for the selector to assess or to prescribe.

It can be seen from this bare outline that the only "scientific" technique so far known—that of breaking down the job into its component parts and analysing the qualities needed for each—leads us to the conclusion that a minimum standard must be set in the qualities listed in the "Profile" if the potential officer is to be efficient in all aspects of his job. We are still no nearer to finding a rule-of-thumb method for deciding those minima, and they must continue to be set in the minds of the assessors by the "collective, practical wisdom of the Service." This may not entirely satisfy the political directive to which we referred at the outset, but after all the consumer is normally the best judge of what he wants. The "Profile" is now clearly seen to be, not a magic talisman by which suitability can be automatically assessed, but merely a useful check list for the selector to ensure that no important minimum has been overlooked by a hasty or prejudiced impression.

THE THIRD STAGE—GRADING

Just as there is a constant search for some touch-stone of selection, so there is a tendency to look for some tidy system of grading, such as a numerical weighting of each quality to give a mathematic order of merit. Now it is clear that some candidates will, in fact, prove better officers than others, and they will do so by virtue of their basic qualities and the way they respond to training. It may even be possible to agree which qualities are the most vital. Nevertheless, any quantitative assessment by numerical weighting is a delusion. The human personality is too complex, and the factor of motivation is too variable for a mathematical assessment to mean anything at all. The danger of such methods is that they provide a facile solution which looks well on paper but means little in effect.

Moreover, we reach here in its acutest form the problem of immaturity. What should be the grading of the immature boy who shows great promise, as against the mature boy of less potential ability? This type of problem defies all precise form of grading, and we are thrown back once more on the judgment of a number of experienced officers who have spent their lives in commanding and training young men. So here again we are unable to satisfy entirely the political directive, which enjoins that justice should manifestly be seen to be done. But the "Profile" again shows up clearly the factors which have influenced the board in arranging their order of merit.

CONCLUSIONS

This outline has shown that the selection of Regular officers is a highly

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complex problem, which consists of the three stages of analysis, projection and grading. We have shown how modern psychological methods have led to a more precise and comprehensive process of analysis than the pre-war methods, so that a full and rounded picture of each candidate is presented at the end of three days. In the other two stages of selection, psychology has at least introduced a more objective approach to the problem, and the modern technique of "Job Analysis" seems to indicate that the qualities assessed in the "Profile" all have their necessary place in the R.A.F. officer's job. In the key problem of all —which candidate the Service wants—psychology can offer no rule-of-thumb answer, and we are thrown back, as before, on the "collective, practical wisdom of the Service." Perhaps that is not such a bad answer after all.

"PROFILE" USED BY THE R.A.F. SELECTION BOARD

	V.G.	Good	High Av.	Low Av.	Poor	Very Poor
MOTIVATION						
Service Motivation						
Level of Aims						
Self-Centredness						
Improvement of Knowledge						
PERSONALITY						
Bearing and Manner						
Calmness						
Power of Expression						
Confidence						
Energy						
Sense of Humour						
CHARACTER						
Determination						
Assertiveness						
Integrity						
Initiative						
Decisiveness						
Conscientiousness						
Sense of Responsibility						
SOCIAL						
Consideration for Others						
Influence on Others						
Leadership						
Firmness in Handling Others						
Adaptability to Others						
Co-operativeness						
Loyalty						
INTELLECTUAL						
Breadth of Outlook						
Judgment: Common Sense						
Planning Ability						
FACTUAL						
Scholastic Record						
Intelligence Rating						
Current Affairs Rating						
Athletic Record						

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AIR FORCES FORUM OF DISCUSSION

(Write to the R.A.F. Quarterly about it)

LETTERS TO THE EDITOR

DEAR SIR,

May I venture to correct a somewhat false impression that the former Commanding Officer of the Oxford University Air Squadron may have created by his article "The Universities and the R.A.F.," namely that university air squadrons confine their activities solely to training undergraduates as pilots. This was certainly true until a few months ago when the establishments of the three older squadrons, Oxford, Cambridge and London, were increased to allow for the training of up to twenty-five fighter controllers each to start later this year. Furthermore, facilities have been provided at Cambridge to enable a small number of undergraduates to be trained as navigators also, and at the present time the first six navigator members are carrying out their annual period of continuous training at No. 1 Air Navigation School.

Wing Commander Foxley-Norris wisely left that much-argued issue as to which is the senior squadron, Oxford or Cambridge, as an open one. Even if there is no question this time that Cambridge is the first university air squadron to offer navigator training, may I go as far as to point out that at least the Air Ministry was wise enough to go to Oxford to find the first navigation instructor!

Yours faithfully,

J. H. DYER, *Flight Lieutenant.*

SIR,

Flight Lieutenant Dyer is quite right in saying that I omitted to mention the training of fighter controllers and navigators in university air squadrons. The omission was, however, intentional in that both schemes are in their infancy, and it is too early yet to judge of their success, particularly in regard to the provision of permanent officers in those branches.

With regard to the decision to select the Cambridge Squadron as the first to train navigators, might I be so bold as to suggest that it was perhaps due to difficulty encountered by the members of that squadron in finding their way round the uncharted wastes of East Anglia?

Yours truly,

CHRISTOPHER FOXLEY-NORRIS, *Wing Commander.*

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THE CHANGING PATTERN OF WAR

By Aquila

WE often hear it said that no two wars are alike. It is difficult to see any good grounds for supposing that they should be. Innumerable melodies have been conceived from but a few musical notes, and in war innumerable patterns have been woven from a few major factors . . . like geography, the means of movement, weapons and man's ingenuity in combining them in defence and offence. In the jungle, conflict depends mainly on brute force. For long the issue of wars between nations depended mainly on numerical strength in men and arms. It was not so much numerical strength in men and arms but the adroit use of the power to control sea-going commerce that raised Britain to pre-eminence in the maritime world. As scientific and technical progress continues to lift the barriers of distance from the eyes and ears of the peoples in all parts of the world, nations may also contrive to impose their wills upon each other by political persuasion.

And so the conflicts of our time do not rest alone upon brute strength but upon an increasingly complex pattern of political, economic and strategic factors in which the interdependent values of each may be infinitely diverse. Nevertheless, armed strength remains the ultimate force of diplomatic persuasion!

* * *

From a military point of view the art of war was long ago expressed by Xenophon as the "art of retaining one's freedom of action" . . . freedom to move decisive force to the right place at the right time, and to prevent the enemy doing the same. For long the technical limitations of man's means of movement confined the spheres of warlike action to the sea and land, and the resultant pattern of political, economic and military factors divided the world into two broad groups of powers . . . continental and maritime.

In these conditions Britain was secure against direct invasion as long as she could maintain her freedom of action at sea. The spread of trade made her increasingly vulnerable to indirect attack on the seas and it was there that continental powers contrived to threaten her. Meanwhile she could exploit her freedom of action to assault the enemy coasts where and when she liked in a series of limited operations. Whilst land communications severely restricted the supply and movement of force, Britain could generally concentrate greater force wherever she chose to strike.

* * *

Perhaps the first major change in this pattern of war between continental and maritime power was brought about by the industrial revolution. Britain became even more dependent on the control of the sea not only for her economic wealth but for her fighting strength . . . especially oil for her ships. Technical ingenuity gave her enemies the U-boat, whose freedom of action was largely independent of her control on the surface. And on land the railway permitted the concentration of huge armies that could be kept in the line indefinitely.

Both these changes altered the pattern of war in favour of a continental power, and in 1914 the balance had to be redressed by allying herself with France in a major land war. On land the balance between the defensive and offensive power of weapons led to a war of attrition. In broad terms the German

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armies were contained in France and British naval might was contained in the North Sea until finally the deadlock was broken when the economic stranglehold of the Allied blockade proved more decisive than the German U-boat campaign.

* * *

In the First World War the U-boat had challenged the control of the sea. In the Second World War the aircraft was to challenge both the control of the sea and land. The German armies overran Poland and France, exploiting their full strength under their ascendant air forces. The Allies were already weak on land and were further weakened by the enemy air action. They might have held if the enemy air forces could have been beaten off, and would have been doubly strengthened if they had also been given strong tactical air support. But the strategic and tactical balance left them at a hopeless disadvantage.

In 1940 the Germans hoped to snatch temporary control of the Channel to invade Britain. They pitted their air forces against the defending sea and air strength. But the British held the Luftwaffe at bay, thereby guarding the air approaches to her industrial and economic heart, securing the seas for her shipping and naval craft, and keeping the geographic barrier of the Channel intact against German military invasion. Nevertheless, Britain was still to suffer sharp setbacks as at Crete, where the German air forces successfully isolated the island and destroyed armed resistance on land, and in the Far East, where the Japanese air forces nullified British control of the sea and opened the way for their invasion of Malaya.

Meanwhile the great industrial installations and the huge flow of supplies required to support modern fighting strength left nations more than ever dependent on the security of their economy, their centres of industry, communications and workers. As their vulnerability increased and the power to attack them multiplied, so the economic war extended in scope, and the pattern of war became more and more a contest for control of the approaches from which the greatest danger threatened in defence and through which the most varied and hurtful action could be taken in offence. In due course Allied air ascendancy allowed them to carry their attack deep into the heart of Germany to destroy the weapons of war before they could be brought to bear and even before they could be made at all.

The final stages of the war in Europe were reached when Allied control of the air had created the strategic and tactical conditions in which their land forces could close with the enemy. Strategically German war potential had been weakened, and tactically the balance of weapons was heavily in favour of the Allies. The German armies had been designed on the assumption that the air would be secured above them. They were heavily mechanized and fatally vulnerable to air attack. As German military commanders have so rightly remarked, it was only a matter of time before they were reduced to fighting "like a savage against the most modern European troops."

* * *

Air ascendancy had become the condition for the effective prosecution of war and all operations of war. The changing pattern is generally accepted, but there is always the danger that the strategic and tactical influence of air power can be misread in a campaign like that in Korea. Strategically the control of the air was unchallenged, and tactically the enemy armies were not held back without the use of large armies and great quantities of weapons and equipment.

But think what might have happened had the Communists wrested control of

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the air from the United Nations forces. Could sufficient forces have been landed in Korea to hold the peninsula? Under air ascendancy an adequate enemy air force might have reduced Pusan's capacity by 20 or 30 per cent. or more, and the tables might well have been turned. And how many ships could have reached Pusan at all? The support of the United Nations warships and carriers in the battle ashore would have been restricted, their offensive air forces based in Japan might have been confined to action under cover of darkness or bad weather, and their defensive fighters might have been powerless to cover the vulnerable sea and land communications or the troops fighting at the front.

In Korea we see the challenge of a Communist army in its least vulnerable form to air attack . . . an Asiatic infantry army. It could be nothing else without control of the air, for the United Nations air forces would long ago have dislocated its supply lines carrying the great quantities of fuel, ammunition, road-making material and heavy weapons it would require. The task of the United Nations troops would have been eased and the result would almost certainly have been decisive. There is therefore a nice tactical balance to be set between land, sea and air forces in any particular form of warfare. For the most powerful mechanized army tends to become the most vulnerable to air attack, while the least vulnerable is an infantry army content with the lowest standards of life and the most rudimentary weapons. Although the United Nations force enjoyed the tactical advantages of using modern land weapons without interference from the air, and with considerable direct and indirect air support, the strategic advantages were not exploited . . . for very good political reasons.

* * *

As has been pointed out by many, the political influence of air power is probably the main stabilizing factor in the world cleavage today. The Russians could long ago have marched to the coast of Europe or to the shores of the Persian Gulf, but that would only have been the beginning. They would have been committed to an indefinite air bombardment supported by a huge economic and industrial potential lying for the most part beyond their reach.

However, if they felt that by overrunning the whole of the Eurasian continent, including the considerable industrial potential of Western Europe and man power of Asia, they could challenge the New World, and if they believed they could survive the unparalleled devastation they would certainly bring upon themselves, they might still think it worth the risk. Certainly if they ever reached a position where they could give as good as they got they would hardly hesitate . . . even though it might take them several years to turn their continental gains against their enemies.

It is to guard against such a Russian venture that the N.A.T.O. countries are preparing to defend their own soil which has also become the bridgehead of Western power. This involves the establishment of a perimeter manned by a suitable balance of armed force to withstand the glowering might of massive infantry armies supported by heavy tanks and large tactical air forces. This in turn implies the maintenance of secure sea communications, and, farther back, the integrity of the industrial and economic potential from which it will draw its main supplies.

The tactical pattern of the N.A.T.O. land forces is based on a higher degree of mechanization than the Russian. This makes them all the more vulnerable to air attack, and they should therefore be complemented by proportionately greater air strength. And yet it is the enemy who has both the advantage of comparatively invulnerable armies and wields the larger tactical air force. Indeed, the

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main strength of the N.A.T.O. countries is their technical, industrial and mechanized power rather than sheer man power. If this advantage is not to become a disadvantage the N.A.T.O. nations must strain every nerve to redress the balance of their forces and ensure certain and lasting ascendancy in the air.

Correspondingly the comparative vulnerability of sea communications, exposed to attack from above and below the surface, also emphasizes the Western need for air ascendancy. Without it shipping will be an easy prey to the air and the surface vessels engaged in hunting the U-boat will be seriously impeded, while the air forces will be powerless to wage an effective offensive defensive. Finally, the major political benefit derived from the threat of preponderating air power will be nullified if the enemy doubts our power to exploit the highways of the air to attack the main centres of his war potential.

When we look farther into the future we can foresee the era of guided missiles both in defence and offence. These, too, will alter the pattern of war and the tactical balance of arms. Some people seem to think that air power will then cease to be a factor in war. But as the power of missiles hurled through the air becomes greater so it will be all the more urgent to control the air. And just as the sea may often be controlled by air forces alone, so the air may one day be controlled without sending a single man aloft. Indeed, air ascendancy is already the dominant factor in war, and the issue of the air battle is likely to be even more decisive than the victories off Gravelines in 1588 or off Trafalgar in 1805.

And although the defensive weapons may be ten times more effective today, the many factors affecting war are multiplying the opportunities for offensive action in the air by twenty and thirty times, and its power increases in even greater degree. War may progressively become a long-range bombardment in which the best and perhaps only defence may be the attack, as the infantryman with his rifle already knows only too well. Ultimately the scientists may devise some apocryphal weapon which will destroy whole continents at a single blow, and then the only freedom of action left in war will be surprise . . . for he who strikes first will possess the ashes of his enemies for what they are worth.

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THE FOUNDATIONS OF R.A.F. DISCIPLINE

By Wing Commander R. C. O. Lovelock, D.F.C.

IT is now generally agreed that discipline must be based upon a belief in its own necessity, and that, although it must be backed by force, it must not rely upon force. Consequently officers must be able to analyse it and show that it is based upon logical and ethical foundations. Whilst it is fairly easy to interpret the necessity for discipline that exists in armies and navies and for flying and combat in air forces, it is not so easy in air forces to ensure that the military forms and customs which govern the ground personnel are whole-heartedly accepted as being appropriate to the daily life of men who are technicians and to a great extent non-combatant.

With the exception of those kinds of discipline which are intentionally penal and corrective, it is only justifiable to restrict the freedom of the individual by a disciplinary code in order to obviate danger of some sort. This is even true of the civic discipline for which we British are renowned, and by which we co-operate almost unthinkingly with our friends and helpers the police in maintaining the common law, for in this way we are combining to frustrate those who would break down our society. From this relatively light requirement it is interesting to trace a motive of increasing urgency, necessitating a progressively stricter code, through various non-military organizations such as fire brigades, police forces, hospitals, merchant shipping and civil airlines, to the fighting Services, culminating at last in the standards demanded by the Royal Marines and the Brigade of Guards.

Each of the above non-military organizations is subject to a code of discipline because it is responsible for security in some way, and generally it may be said that the particular code in each case is tempered to suit the task. Not only does each of these activities embrace a drill of "vital actions" but there is also, in most, an influence of either a physical or an ethical nature present even in non-duty hours. In police forces and the nursing profession, for instance, there is the need for temperate habits and a high standard of personal integrity, whilst in merchant ships there is the obvious physical restriction of the environment. To a great extent these professions constitute a "way of life" whereby the original requirements are strengthened by the constant and unrelenting repetition of what was originally learnt as a drill; all without much necessity for the imposition of further exercises by those in authority. It is very desirable that the discipline of fighting Services, too, should be of this vocational submission to the virtue of duty for its own sake; but where the motive is not readily apparent the sense of duty has to be inspired, and this process can be assisted by lucid interpretation.

The disadvantage that all fighting Services generally have to contend with in peace time is the obvious one of there being no shooting enemy. In the absence of this important stimulus, all the Services must rely to some extent on "make believe" to fashion themselves for war. Yet, although it is only through emphasis upon the exigencies of battle that an acceptance of military discipline can be fostered, it is also true that navies and air forces each have the advantage of being constantly at grips with an untrustworthy natural element, thus maintaining an urgency upon which it is easier to graft military requirements. The basic military discipline required in all the fighting Services can best be understood

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from what is required of the infantry, since basic military man remains a foot soldier. Fighting soldiers are required both to attack the enemy and to hold on to a position to the last man and the last round. Moreover, since they have lethal weapons constantly to hand it is necessary to provide for their restraint both in victory and during retreat, when they are inflamed by terrible sights and actions and by the contrast of their own frugality with the opportunities for unlimited pillage. Their lives therefore have to be governed by a rigid code of "military law" whereby cowardice, desertion and insubordination are punishable speedily and with exemplary severity; yet the fear of punishment is not the real motivating influence within a combatant unit. The foot soldier is willing to embrace discipline in order that he may increase his chances of survival within a perilous calling. A similar realization of the urgencies of battle, with appropriate modifications, has to be created for all other branches of the armed forces.

Since navies and air forces have to contend with the elements before the enemy, let us also examine the type of discipline which is forced upon all travellers who undertake long-range, *unsupported* movements between established bases. It is applicable to seafarers, aviators and those who travel by surface routes across the desert. Whether the movement be towards a harbour, an airfield or a water-hole, there is in each case a preoccupation, between bases, with mere survival which becomes evident in a well-developed sense of responsibility and vigilance. In relation to the aviator the impulse may be summed up as cockpit drill and flight planning. From the above it will be seen that the influence towards good discipline in navies is doubly strong, since the "military" type, which here appears as gunnery, is grafted on to the age-old discipline of the sea inherited from sailing ships. It is well known that sailing vessels carelessly handled in a gale might capsize or founder, or at least stand the risk of being dismasted, so even in steam vessels the sailor is handy and alert and ever concerned with the safety of the ship and all hands aboard her. It has long been recognized, too, that disorders aboard a ship in harbour can usually be cured by putting to sea. From a purely military point of view, life aboard ship carries, at sea, an environmental preventive of desertion; nor is there any safe refuge for cowardice in action, since no one in the ship's company of a man-of-war has anything but a steel plate between himself, the enemy and "Davy Jones's locker." Under these circumstances leadership is strong, direct and effective, and crews are hardened by weeks of monotony and discomfort before meeting the enemy in battle. There are not even any of the minor irritations concerning fatigues, since domestic "chores" are as much part of the seaman's life as watch-keeping.

It might therefore be expected that in air forces the influence towards good military discipline would be heightened by similar causes. Certainly in the R.A.F. this is true of air discipline, both in relation to battle formations and to individual crews; we might justly claim that R.A.F. air discipline is the finest in the world and of a real military standard. To lead a battle formation into action must surely be the highest ambition of every officer pilot, and such a formation is also the focus of many hundreds of other hopes and loyalties, since R.A.F. airmen send their hearts into battle in the aircraft they have maintained on the ground. Within the tactical requirements such a formation is as simple and direct a form of military leadership as ever occurs in air forces, with the readily apparent momentum of a "shoulder to shoulder" operation. The leadership of an individual crew is, in contrast, a much less direct command and generally smaller in numbers than the infantry section commanded by a lance-corporal. Each main crew member is a specialist in a different branch of knowledge, and a captain of aircraft has to co-ordinate each of these specialist opinions in the technical

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side of his operational plan; yet his command is nevertheless absolute, both on account of aerodynamical emergencies and because only he can decide whether to go into action and when to break it off. The lives of his crew are always in his hands.

Within the remainder of the R.A.F. organization, however, not only are there fewer apparent influences towards good discipline than in any other branch of the British Services but there are many which are actually disruptive. Probably less than a fifth of the R.A.F. ever flies and fights in the air, a situation which produces a combatant minority and a non-combatant majority. This is a very important factor by itself, since it has already been shown that military discipline is more readily acceptable to combatants. Furthermore, the majority of G.D. officers in the junior ranks are operational aircrew in war, and since the arduous nature of air operations necessitates the standing down of crews before sorties and an interval of complete relaxation after them, the desirable continuity of the influence of such officers with their airmen is frequently interrupted. Nor does this necessary relaxation in surroundings far removed from war automatically harden the character in the same way as life at sea. Finally, although ground tradesmen must be kept mentally aware that one day they may have to defend an airfield and its equipment against enemy ground forces, and must therefore be trained as infantry, and although many of their domestic problems are the same as those of soldiers, it cannot be denied that primarily they are technicians and that they are not by nature military in their outlook. Their training is logical and materialistic otherwise, and they do not respond so easily to spiritual appeals. The demands of planned servicing and the recognition by trade unions of so many Service trades make them tend towards the factory-mindedness of their civilian counterparts, even though collective movements are discountenanced by military law and custom.

Yet air forces cannot be organized on any other basis, and it must be accepted that, although few airmen would deny the necessity for all those who go out against the enemy to be governed by some form of military law lest the default of one should imperil the lives of thousands, they themselves experience only the irksome part of military restraint without the elation derived from bearing arms in combat, and resent being subject to that same law when only their labours and not their persons are projected against the enemy. What logical interpretation can be devised which will stimulate an acceptance of the military type of discipline among the ground crews of air forces?

The emphasis must be upon the airman's identity as a fighting man, both on account of his important infantry role and because the quality of his work has an important influence in battle. The fact that the skill of an armourer can be applied in surroundings that are safer and less disturbing than those in which the weapon will be brought to action is even more fortunate for the armourer than it is for the gunner, but it is no justification for the former tradesman being subject to a less exacting code of law, for he shares both the responsibility and the honour for the operation. Obviously, as has often been pointed out by the leaders of the R.A.F., a Service with such a complicated structure requires leadership of a higher standard than those Services in which the needs from which discipline springs are more apparent. A proper interpretation of the above problem can do much to ensure that the acceptance of good military discipline in the R.A.F. is readily forthcoming.

Perhaps an understanding of the whole problem could be facilitated by diagram. The two inner circles represent the twin hazards which necessitate

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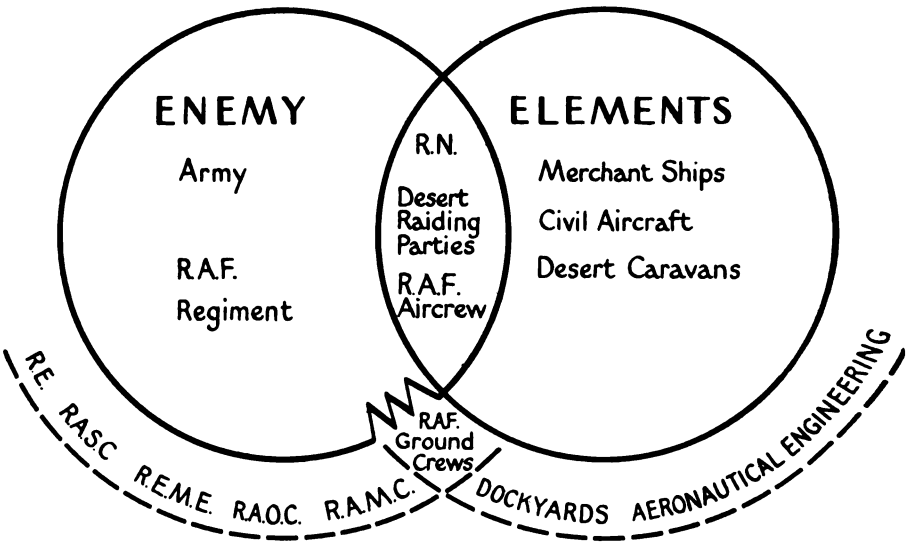

discipline in air forces; that on the left represents the enemy, that on the right represents the elements.

Enclosed by the enemy influence we have the Army combatant units and also the R.A.F. Regiment. Enclosed by the elements influence we have merchant ships, civil aircraft and desert caravans.

Those organizations which are subject to *both* influences are shown within the intersection of the two inner circles, which include the Royal Navy, desert *raiding* expeditions, and R.A.F. aircrew.

Within the dotted line enclosing the fringe of the enemy circle are the administrative corps of the Army—R.E., R.A.S.C., R.E.M.E., R.A.O.C. and the non-combatant R.A.M.C.

Within the dotted line enclosing the fringe of the elements circle are the ancillary services of the Merchant Navy and civil aviation, such as dockyards and aeronautical engineering organizations.

Within the fringe of *both* the elements and the enemy influence can be placed the R.A.F. ground crews, and they tend to stray into the full enemy circle through their association, in action, with the R.A.F. Regiment.

For simplicity, the additional complications presented by formations with dual roles, like commandos, paratroop regiments and naval aviation, have purposely been omitted.

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PLAIN ENGLISH

By Squadron Leader E. J. Tippett

THE extravagances of some official writers have provoked much adverse comment from a variety of people, notably Mr. Churchill during the war. Mr. Churchill is happily able to expose the weaknesses of poor writing and to offer shining examples of clear and sparkling prose, but lesser men who have added their strictures on "officialese" have offered rules of guidance which may lead to poor writing of another style. They call arrogantly for "plain English" and give advice on writing which can only lead to dull and immature English. This article is an attempt to discountenance such false prophets.

What is the purpose of writing—Service or civilian? It is to convey information or intelligence; and this purpose can be served adequately by dull writing. If, however, the information is to be conveyed profitably it must be in an interesting, attractive or arresting form, so as to produce an intelligent reaction in the reader. The writing must stimulate the reader to thought or action, and dull writing is unlikely to do this. Here lies the danger of "plain English."

Why "plain" English, indeed? Who prefers a plain woman to a pretty one, and which is the more likely to be disregarded? Seldom is plainness extolled except in writing. "Penny plain, tuppence coloured." Does not that put plainness in its place? It is true that plain English can convey information, and it is just as true that a beer bottle will hold sherry. But is not sherry the more enjoyable for being served from a sparkling cut-glass decanter? Who would think of using a biscuit tin instead of a brass coal scuttle, a soapbox instead of a spindle-backed chair, or a black-out curtain instead of an evening gown? In short, who prefers plainness to attractiveness?

What is "plain English"? Many who use this term will claim that it means clear or simple, or readily understood English; and so it does. But it also means many other things, as reference to a standard dictionary will show. Thus, people who call for "plain" English when they mean clear or simple or readily understood English are not being "plain." They are indulging in the very ambiguity which "plain English" is claimed to avoid. After all, one meaning of plain is "ugly." Is ugly English what is required?

Writing should always be interesting and attractive and to achieve this it may be expedient to deviate from the straight and narrow path of plainness. Designers of furniture, architecture, gardens, clothes, etc., give their designs appeal by the careful use of decoration and by the choice of form. The embellishments they use for decoration fail in their purpose if they obscure the form or line of the design; they become an irritation to people of taste. Similarly, ungraceful forms defeat the objects of decoration. Writing might be compared with other forms of artistic effort. How, then, can the writer make his writings attractive without obscuring the intelligence by the embellishments? By first paying attention to form. He should arrange his facts and words so as to produce smoothly flowing sentences which reveal the intelligence of the writing clearly and palatably. The major feature of his "design" is a matter of form and most of his creative effort will be expended in achieving it. This will require a measure of polishing, but care must be taken that the character or life of the writing is not polished away; a certain ruggedness is preferable to monotonous perfection.

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Before, or while, he finds his form he has to select his words; and here the craze of modern teachers for monosyllabism comes in for attack. Why is the short word always considered better than the long word? This is a fallacy. Too often familiar words of one or two syllables are used to convey a meaning which can only be expressed adequately by longer and less familiar words. The longer and less popular word frequently gives a shade or subtlety of meaning which is lost by the shorter. Again, the slavish avoidance of the longer word often leads to jerky sentences in which there is tantalizing repetition, whereas the occasional use of a longer word as an alternative, even with the same meaning, smooths the sentences and makes them more readable. Long words, therefore, may be used with advantage to make dull writing livelier, but the writer must beware that no word or phrase he uses obscures the sense of the writing or impairs its form, and he must be quite sure that he knows the exact meanings of the words he uses. The embellishment or decoration must make the writing pleasanter to read or more stimulating to the imagination; it must never be allowed to emerge as the dominant feature, which submerges the intelligence the writing is intended to convey. This is no brief for fussy, pretentious or involved writings, such as the "officialese" which makes the pundits clamour for "plain English"; it is merely a plea that in avoiding the faults of the verbose writer we should not neglect the richness of our language. It would be a pity if the floridity of some writers should lead others to restrict their vocabularies to those of fifth-form boys. English, not "basic English," is still the language of this land. If a reader has to turn to the dictionary for the meanings of words, so much the better, for he is expanding his vocabulary as he reads.

A sentence quoted in the biography of the late headmaster of a major public school serves to illustrate the use of the long word with happy effect. In a sermon to his pupils he is stated to have said: "Let your wit scintillate like the coruscations of summer lightning; lambent but innocuous." This sentence contains four words which probably make the "plain English" pundits shudder, and it offends the tenets of the monosyllabists. Yet the sentence is plain in that its meaning is clear and it would be difficult to find four other words which convey so precisely and concisely the meaning of that sentence. And its form is surely above reproach: it is, in fact, good writing. Perhaps some of the schoolboys would have had to fly to their dictionaries to find out what the "old man" was talking about, but they must have left school with excellent vocabularies.

To summarize: what are the qualities of good writing if they are not embraced by the phrase "plain English"? Firstly, the intelligence must be clear and readily understood. Secondly, the form must be coherent and pleasant. Thirdly, the best words must be used, whether long or short, to express the meaning intended and to relieve the dullness of the writing. Fourthly, any embellishments or tricks must be used discreetly so as to stimulate the reader without obscuring the sense or form of the writing. These principles are applicable to all writing, whether official, factual, imaginative or emotional. The phrase "Service writing" is most unfortunate, as it suggests that writing in the Services is not governed by the same rules as ordinary English. Too often this is true, but it should not be so.

In conclusion, let it be stated that the author of this article does not know what he is writing about. He was trained as a scientist; and that class of scholar is commonly held to be incapable of expressing itself intelligibly or in readable form. He cannot therefore be held responsible for any enormities he may have committed in the preceding paragraphs. Neither need any heed be taken of them if they are unacceptable; they can be dismissed by connoisseurs of English as the ramblings of an untutored amateur.

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THE AIR FORCES IN PARLIAMENT

DEFENCE

DEFENCE, national and international, was again the subject of a spirited debate in the House of Lords on 18th July. It was opened by Viscount Swinton, who, as a former Secretary of State for Air, naturally had much to say concerning the Royal Air Force.

He began by stating two fundamental truths on which all our defence policy and plans should be based. (i) That the threat of Communism is universal; and (ii) that there must be a complete partnership of the British Commonwealth and Empire with the United States of America over the whole front.

Integration

The first fact is surely obvious, and we can do nothing about it except prepare to meet it and defeat it. The second is equally obvious, and we can do a great deal about it. We are, as Lord Swinton pointed out, at a disadvantage as compared with the potential enemy, who enjoys the advantage of a "single directing control." We, on our side, form a "Grand Alliance of many nations," the organization and direction of which would be difficult enough in war and is still more difficult in peace. What is needed is clear policy direction from the top and close integration all the way down. With General Eisenhower at the head of the defence forces of Western Europe, we may be satisfied on that score in that region; but that is not the only region in which the Communist menace may develop into open aggression, nor is the building up of our forces for defence in all parts of the world progressing as fast as it should.

His Majesty's Government has wisely refused to disclose the total contribution which the Royal Air Force is prepared to make to the defence forces of the Western nations and their world-wide interests; but the Minister concerned has given an assurance that we shall conform to the plan agreed by the nations of the Atlantic Pact, provided that the other nations do likewise. Our contributions, with those of other nations, will be integrated under supreme commanders; and integration will extend not only to the strategical and tactical handling of the fighting forces but to the planning and production as well.

Airfields and Mobility

One of the greatest virtues of an air force, Lord Swinton said, is its mobility. But mobility does not depend solely upon the speed and range of its aircraft. It depends also, and to a great extent, on airfields. With inadequate or badly sited airfields a long way from the targets, an otherwise excellent air force is severely handicapped by the time necessarily spent on flying to and from its targets and by its vulnerability to attack *en route* in both directions. Conversely, a smaller and weaker air force can be made more effective if it is provided with well-defended airfields and landing grounds conveniently sited to give easy and rapid access to the enemy's concentrations of troops, industry and supplies. The need for the immediate establishment of numerous suitably sited airfields in Western Europe is of the utmost importance. They can be constructed very quickly with modern machinery and they will give greatly increased effectiveness to our air forces while they are numerically weak and enormous advantage to them when they have been expanded to the planned size, whatever that may be. For this reason, the negotiations for the use of air bases in Spain by the United States are most opportune.

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Production

Lord Swinton discussed also the progress of the aircraft production programme. The adoption by the United States of the Canberra jet bomber and the Sapphire jet engine is a compliment to British design and construction, and the new Valiant heavy bomber promises well. Much is expected of the new "Delta" design, which combines great structural strength with high performance; and it is likely that future high-speed aircraft will conform more or less to that design.

While expressing himself satisfied with progress in design, Lord Swinton questioned whether this was being followed by testing and production without delay. He advocated the construction of several prototypes of each kind, rather than only one of each. For if a sole prototype crashed during tests, further tests would be delayed until a second had been built; whereas if there were several prototypes, testing could be continued without interruption in spite of a few crashes and there would be the additional advantage that different tests (e.g., for performance, construction, armament, etc.) could all be carried on simultaneously, thus considerably shortening the testing time and advancing the date when the type could be put into full production. This would help to make up some of the leeway in delivery to the R.A.F., which was partly due to recent selling of jet aircraft to Egypt and Argentina. As a result, there has been delay in rearming some of the auxiliary squadrons which are still equipped with obsolescent and much-worn aircraft. We owe it to the public-spirited officers and men of those squadrons, who make considerable personal sacrifices in coming up for their training, as well as to the nation as a whole and our allies, to equip our auxiliary squadrons with the most up-to-date aircraft as fast as possible.

Anti-Submarine Action

The Earl of Selkirk regretted that so little had been heard recently about the air element in the control of the Atlantic. More than half of the enemy submarines destroyed in the last war were destroyed by aircraft, and it is probable that the same would be true of the next war. For this reason it would seem desirable (i) to have an air officer of high rank fitted into the Atlantic command organization, (ii) to expand Coastal Command, whose relations with the Royal Navy are close and cordial, and (iii) to ensure that there are sufficient aerodromes conveniently sited and adequately equipped to take the aircraft with which Coastal Command will operate in the near future.

Priorities

Lord Selkirk also asked for information about priorities, and he said that it was now the aim of British strategy that neither the Army nor the Navy should ever have to fight in conditions in which air superiority had not been attained. This fundamentally sound aim is doubtless being maintained; but none of the three Services must be starved for the benefit of another and, since resources are limited, due proportions must be observed. Neither would it be wise to train the Navy and the Army on the assumption that they will never have to operate in circumstances in which air superiority is held by the enemy. The successes of North Korean and Chinese troops in Korea against the overwhelming air superiority of the United Nations' forces show what can be done in such circumstances.

It is also noteworthy that the Chief of the Air Staff said at the Mansion House in June last: "Fighters alone are powerless in defence." This pregnant observation merits considerable thought and raises the question of the relative importance not only of fighters and bombers but also of all other types of aircraft.

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of static balloons and anti-aircraft guns, and of armies and navies. Perhaps the short answer is that all are essential. Our requirements in long-range fighters, at least until guided missiles are brought into operation, is relevant to this question and so is the establishment of Transport Command and the extent to which it can draw upon civil aviation in an emergency.

Transport Aircraft

On the day before Parliament rose for the summer recess, Air Commodore Harvey called attention in the House of Commons to the shortage of transport aircraft in the Royal Air Force. He mentioned, as the Earl of Selkirk had done in the House of Lords, the recent move of an airborne brigade to Cyprus by sea in an aircraft carrier, which took ten days. We ought not, he said, to waste the time of sailors, soldiers and airmen in long sea voyages.

This is true. And suppose the troops are wanted suddenly and urgently in some distant theatre overseas, the only sensible thing is to transport them by air. But if we have not the necessary transport aircraft, how is that to be done? We can borrow troop carriers from the Americans. Or can we? Though doubtless willing to lend, they may not always be able to spare them. Transport Command should, therefore, be provided with an adequate number of large aircraft so that they may be able and ready to perform any necessary air lift at short notice, and that means not only troop carrying for the Army but also lifting the ground staff and equipment of R.A.F. squadrons required for immediate action anywhere in the world.

For too long Transport Command has been reduced to a shadow of its former self. A strong Transport Command is essential to mobility. Mobility is the key to success in modern warfare, and—no less important—mobility can be exploited to prevent war.

Some months ago the House of Commons was told that there would be a number of auxiliary transport squadrons. As these are not yet formed, we must assume that their aircraft are in course of construction and that as soon as the aircraft are ready the squadrons will be formed.

We may take some comfort from the Secretary of State's assurance that we have a sufficient reserve of Hastings long-range transport aircraft for some years to come and that, meanwhile, the Air Ministry is seeking a suitable four-engined jet transport aircraft to replace the Hastings. In an early emergency we could, it appears, obtain some of the American C.119's, which are well adapted to our present needs.

Bombers and Fighters

A brighter picture is painted of our bomber and fighter strength. The Canberra is said to be the outstanding light jet bomber in the world today. A squadron of these is now being formed and "a respectable number" will be formed during the next twelve months. The new four-engined jet bomber, the Valiant, will be superior to the Canberra in range, speed, altitude and load-carrying capacity and should give us the lead in heavy jet bombers. The New Hawker interceptor, designed to deal with any bomber likely to be in service for some time to come, should have a higher performance than the Russian MIG. 15 and the American F.86.

This is all to the good, but excellence in fighters and bombers cannot make up for inadequate provision of transport aircraft. Nor can it atone for any neglect of Coastal Command, which proved itself indispensable for anti-submarine work during the last war and will surely have an equally essential role in the next.

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CIVIL INTERESTS OF RESERVE AND AUXILIARY PERSONNEL

All who have reserve and auxiliary personnel under their command will be gratified to know that the civil interests of these men have been receiving due attention in Parliament. The Reserve and Auxiliary Forces (Protection of Civil Interests) Bill passed its third reading in the House of Lords on 26th July.

It has long been recognized in the Services that morale depends to a great extent on the peace of mind of the individual sailor, soldier and airman. If the man is free from domestic worries, he will be able to devote his full attention to his duties; and conversely, if he is worried about his private affairs, his efficiency is inevitably impaired. The welfare problems of reserve and auxiliary personnel are similar to those of Regulars, with the addition of certain very important matters peculiar to those who volunteer, or are called up, from civilian life for short periods of intensive training. This interruption of the normal course of their business and private lives causes dislocation which may, and frequently does, involve hardship and financial loss. The purpose of the Bill is to give reasonable protection to these men in respect of their civil rights and liabilities. The Bill is divided into seven parts, six of which deal with separate problems and the seventh with general and administrative matters.

Finance and the Home

The first part of the Bill deals with the debts and other obligations of a Service man and of other people affected by his call-up. Broadly speaking, it provides that payment of debts may be enforced upon these men only by permission of the Court. The second part protects the Service man's home. For men serving with the Armed Forces for three months or more, this protection takes the form of extending the Rent Acts to premises occupied by the Service man or his dependants, where those Acts do not already apply to them. The "tied cottage" is, however, sometimes an exception.

Business Premises

Part III of the Bill protects business premises. Here the aim is to protect the "small man," the working proprietor, from termination of the tenancy of the place where he carries on his business or profession; but it applies only to those who are called up for three months or more. Part IV protects a man's superannuation rights while on service, in the same way as National Service men's superannuation rights are protected. Its purpose is to permit public authorities and the trustees of private pension schemes in industry and commerce to treat, for superannuation purposes, the man's period of service as though it were a continuation of his normal occupation.

Civil Pay and Life Policies

In Part V of the Bill, permission is given to public authorities to make up, if they wish, the balance of civil pay for certain of their employees called up for service who are not already covered by existing powers. (These provisions do not *compel* the authorities to make these payments, they merely make it legally possible for them to do so.) In Part VI, protection is given against loss of benefits where owners of life and industrial assurance policies (on which not less than one year's premium has been paid) are unable to pay the premiums because the owner, or some other person, is on service. Broadly speaking, policies may not be forfeited because of non-payment of premiums due to service, and any policies already forfeited in similar circumstances before the Bill is passed are to be reinstated.

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THE SAGA OF SERGEANT JOSS

BY M. H. LE B.

ON looking back, there is little doubt that Sergeant Joss got off to a poor start with his Commanding Officer. On landing from his first operation with a Spitfire squadron in Italy, he displayed with some glee and considerable pride an ugly gash on the underside of one wing of his aircraft. This, he explained to a sceptical C.O. who had been on the same sortie, was the result of flak. "Heavy, intense, accurate flak at 8,000 feet," he added echoing the clichés he had overheard in the ops. tent. His story lost some of its effect on the admiring audience, however, with the arrival on the scene of the local R.A.F. Regiment Flight Commander brandishing the bent barrel of a 20-mm. anti-aircraft gun. Far from having been caused by non-existent flak, the damage to Sergeant Joss's aircraft had been inflicted by a very friendly gun indeed. A gun, moreover, that had been minding its own business fully ten yards from the edge of the landing strip—until brought forcibly into contact with a Spitfire being held off from its third bounce.

After this episode there was no holding Sergeant Joss, and he went from strength to strength or, rather, from near accident to near accident.

At the time, the squadron was based on the Adriatic coast of Italy near the port of Ancona doing a variety of jobs from armed reconnaissance to straightforward air defence. The day usually started with a weather recce. at first light by a section of two aircraft. A further section remained at readiness on the airstrip as the enemy had been in the habit of sending one of his own recces, composed of two M.E. 109's, down to Ancona. On the day in question, Sergeant Joss, on one of his short periods of flying duty in between protracted periods of being grounded, set off with his section-leader on the weather recce. Flying Officer Hackem-Downe stayed behind at readiness with his No. 2.

Mobile radar of the type used in Italy in those days was never wholly reliable, particularly when the problem of identification was complicated by people like Sergeant Joss forgetting to switch on their I.F.F. So, at about the time the weather recce. should have been approaching base on its return, no one was surprised, and certainly not Hackem-Downe, when the readiness section was scrambled. However, there was always the possibility that the G.C.I. station had made a mistake and plotted a couple of real Huns; so Hackem-Downe and his other half leapt into the air with all the old enthusiasm and set course with everything including the seat-adjusting lever hard against the instrument panel. Soon, after two or three vectors, Hackem-Downe sighted two aircraft in the distance at nought feet over the sea. In fact, of course, these were the two Spitfires returning from the dawn recce.—the G.C.I. controller had not made a mistake.

This last pertinent fact was still unknown to all those concerned and before the two sections were close enough to identify each other as friendly, when the converging aircraft still looked no bigger than liver spots, Sergeant Joss, for reasons which he was never subsequently able to explain coherently, turned about and set off in the direction whence he had come. Now Hackem-Downe was no fool, and putting two and two together he deduced that this must indeed be a 109, else why should it have turned tail and run? So he bent the throttle lever a little more and gave chase. But before he could get much closer the supposed M.E. 109 flew straight into the sea. Hackem-Downe was an honest man, but here was the easiest 109 destroyed he was ever going to claim and, to add verisimilitude to his claim,

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he decided to loose off a few rounds of ammunition. At that moment a body popped out from under the water. This was a new factor. Moreover, the body was wearing what looked suspiciously like an R.A.F. Mae West. Furthermore, it started to climb into what was unmistakably an R.A.F. dinghy. Unmistakably it was Sergeant Joss. A disappointed Hackem-Downe changed over to Channel "D" and started air/sea-rescue procedure.

It so happened that the crew on duty with the air/sea-rescue Walrus that day was composed of two sergeants from Canada, neither of whom had ever taken part in a pick-up before. Nevertheless, they set off, and, because Sergeant Joss was paddling about only three miles off the enemy coast, they were given an escort of Spitfires. The dinghy was found without incident, and a short while later the Walrus landed alongside and took Sergeant Joss aboard. Unfortunately, the inexperienced crew had omitted to take account of the wind speed or the state of the sea before alighting and they now found it impossible to take off again in the choppy seas. And the seas were getting choppier all the time. There was nothing left but to point the nose of the Walrus hopefully in the direction of the open sea, keep the engines running and pray that the high-speed launch which had by now been summoned from Ancona would reach them before the petrol ran out and the aircraft drifted on to the enemy shore.

Long before the launch could reach the Walrus the latter did run out of petrol. There followed for the pilots in the circling Spitfires an anxious, not to say exciting, time watching the launch making slow headway against heavy seas and the Walrus, in constant danger of capsizing, creeping closer to the enemy coast. Unfortunately, the improvident Walrus captain had very soon run his batteries dry and it was impossible to instruct him over the R.T. to take to the dinghy and await the arrival of the launch. So the inevitable happened and the Walrus beached itself on the enemy coast under a steep and slightly overhanging cliff.

A short while after, the H.S.L. arrived on the scene, and the master very courageously brought her in as close as he dared in those shallow waters standing off about fifty yards from the shore. But now another factor arose to complicate the problem. A platoon of bloody minded German soldiers arrived at the top of the cliff. Luckily they were for the time being armed with nothing more than rifles and, of course, they were unable to draw a bead on our three non-commissioned friends hiding under the cliff face. The soldiers did, however, take pot-shots at the H.S.L., which replied with its forward turret, the escorting Spitfires also taking part. The enemy's fire was not very effective.

Meanwhile, the master of the H.S.L. was shouting at Sergeant Joss's party through a megaphone, telling them to swim for it. There followed a keen discussion among the three sergeants when it came to light that neither of the two members of the air/sea-rescue team could swim at all. So Sergeant Joss bade a sad farewell of his recent saviours, stripped, redonned his Mae West and swam out to the boat, where he arrived safely, oblivious of the fact that the Huns had been trying to pick him off from the cliff-top. On hearing of the plight of the two left behind on the beach, the master decided to swim to the shore himself with a line but, just as he was about to jump into the water, the enemy brought up some heavier artillery in the shape of a 20-mm. gun. Rightly deciding he could not risk his craft further, the master pulled away and set course for Ancona.

Well, that is the end of this episode in the adventurous life of Sergeant Joss—except that the H.S.L. hit the boom at the entrance to Ancona harbour. That evening Sergeant Joss's C.O. totted up the profit and loss for the operation: one Spitfire lost, one Walrus lost, two N.C.O. aircrew prisoners of war, one high-speed launch damaged. But Sergeant Joss was back with his squadron.

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MUSIC! MUSIC!! MUSIC!!!

By Flight Lieutenant A. B. Avery

IT all started when the S.Ad.O. opened the hangar doors in the bar one lunch time. "You're a musical character," he said (I see no reason why such sagas as "If I were a marrying girl" should be forgotten, and generally spend the latter part of dining-in nights keeping the old songs evergreen at the piano). "Perhaps you can tell me where I can sell a set of band instruments?"

"Sell a set of band instruments?" I repeated. "We could do worse than to buy them ourselves. A little music around the place would make a lot of difference."

"Well, you've had these instruments, old boy," replied the S.Ad.O. "We found them in a corner of that old hangar we cleaned out the other day, and the C.O. says that they are to be sold to swell the P.S.I. funds."

I tackled the C.O. at once. He talked of balance sheets with unhappy endings, and said that P.S.I. needed the money. In the end, by painting a glowing picture of a delighted A.O.C. showering compliments upon all concerned after hearing the station band at his next inspection, I won him over. "But mind you," he said, wagging a minatory finger, "I want to hear this band on parade before Christmas —or else." It was then October.

I almost regretted my rashness when I saw the instruments. They hadn't been played for ten years—and they looked like it. To start with, they were encrusted with the venerable patina characteristic of the ancient artifacts which one digs up out of Roman villas. The valves of the brass instruments were jammed solid; and I'm not shooting the least bit of a line when I say that I found a bird's nest in the B-flat bass.

Having obtained a disused hut for my band room, I removed my new-found treasures there and set about getting them into some sort of order. A can or two

[Photo: Mr. Snaps, Felixstowe

Band of the R.A.F. Station, Felixstowe, June, 1951

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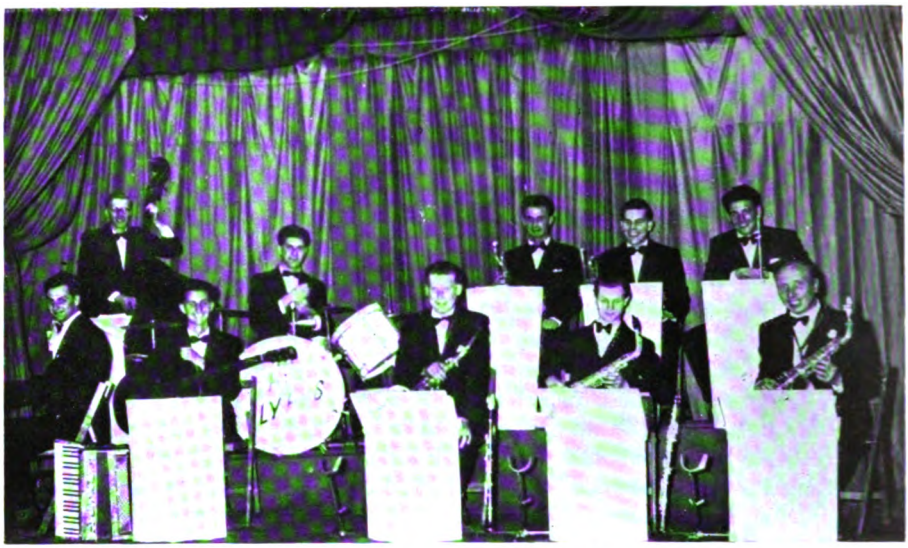

The "Hi-Flyers" Dance Band, all airmen of the R.A.F. Station, Felixstowe

of penetrating oil unfroze the sticky valves, and I went through so much Brasso that the Equipment Officer seriously considered having me shadowed by the Special Investigation Branch to find out which of the local stores I was supplying with this commodity. Something like a fortnight's hard work and scrounging produced fifteen musical instruments, not counting the kitchen effects, to use the forthright term applied in musical circles to the percussion section.

The usual notice in station routine orders produced three musicians. The first of these, on having the project explained to him, said: "Oh—I see, sir. I didn't think you meant a military band. I'm quite a serious musician, and all that sort of thing is so raucous and vulgar, isn't it, sir?" I referred him to Sir Adrian Boult and sped him on his way. The next man wasn't quite so highbrow. He would be delighted to play the trombone. I handed him the instrument and put an easy piece in front of him. Too bad. He hadn't a note of music, had never played anything in his life, but was willing to learn. This wasn't too good. Christmas, the C.O.'s deadline, was looming alarmingly close. The third man, however, could and would play the euphonium. Had he any experience? Well, he'd played for the Salvation Army at home, and would like to keep in practice. This was much better. Did he know of any other musicians on the station? He did.

I sometimes think it is useless to put notices in S.R.Os. Nobody reads them. One of these days I am going to insert a notice to the effect that any airman who reports to me by H hour on D day will receive a pound note; and I'm confident I shan't be out of pocket. My euphonium player gave me the names of some ten airmen who could play, and I went and collected them. I was so desperate that I was prepared to have them marched under escort to the band room, but in the event they came along quite happily of their own free will.

The first rehearsal was terrible. It was cacophonic, chaotic and ear-splitting. The idea of the earliest military music was to strike terror into the hearts of the enemy. We would have ensured the victory of any side that we played for. The toughest foeman would have fled from the frightful din.

October merged into November, and things weren't getting much "forrader." The toughest job was to melt the hard hearts of senior N.C.Os. and prevail

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upon them to release their musicians from duty to attend rehearsals. An intensive air exercise also took toll of the hours available for music.

It happened quite suddenly one afternoon. I lifted my baton; and in place of the pandemonium that my tormented ears shrank from, there came a completely recognizable and even passable version of the R.A.F. March Past. We forged ahead rapidly after that. The day before the C.O.'s audition was bright, sunny and warm—one of those days when December seems to cast her mind back benevolently to the splendour of September. Just the day for playing in the open, in fact. We formed up very stealthily behind the N.A.A.F.I.; I told my musicians "Well, chaps—this is it"; and we swung around past Station Headquarters in full cry. Up went the C.O.'s window, and for a sickening instant down went my morale. It was all right, however—the Old Man was beaming. The audition parade the next day went even better. The station band had arrived.

We performed for the A.O.C.'s inspection parade the other day. In fact, we had two A.O.C.'s parades on consecutive days—our own and that of a neighbouring unit, who asked us to help them out. Believe it or not, a delighted A.O.C. did say several quite nice things about us; and since the A.O.C. is more than knowledgeable in matters musical his appreciation repaid the work that had gone into the band.

If your station has a strength of a few hundred it is extremely likely that you have the makings of a band; and K.R. 2060 *et seq.* will give you all the information you need to get it going—including the way to apply for the very essential financial assistance you will require. You'll need a fair knowledge of music, of course, but nothing out of the ordinary amount possessed by the average musical amateur. The *Treatise on the Military Band*, by Lieutenant-Colonel H. E. Adkins, a late Director of the Royal Military School of Music, will supply you with pretty well all the answers; and this you can get from Boosey's, the well-known Regent Street musical house. I certainly hadn't a clue on military music when I started our band—and what one fool can do another can!

You'll need something of Job's long-suffering character and a winning way with your fellow flight commanders and their senior N.C.Os. It is really remarkable how stubbornly unmusical a flight sergeant can be when it is a matter of letting off one of his airmen to play in the band.

If you decide to have a crack at starting a band at your station don't give way to premature despair. The first six months are the worst. Once the Old Man has received a few "thank you" notes from local bigwigs and neighbouring station commanders for musical services rendered he will get extremely enthusiastic and co-operative over the idea—and we all know how the C.O.'s enthusiasms have a way of spreading downward!

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[Air Ministry Photo

Her Royal Highness The Princess Elizabeth, Duchess of Edinburgh, on 1st August, 1951, with cadets, after the Graduation Parade at the Royal Air Force College, Cranwell

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CURRENT EVENTS

H.R.H. The Princess Elizabeth at Cranwell

ROYAL visits will ever be treasured in Cranwell memories, adding as they do to the history of the Royal Air Force College further records of the close interest that has always been taken by the Royal Family in Cranwell.

On 6th July, 1948, His Majesty The King presented his Colour to the Royal Air Force College. This was the first King's Colour to be presented to the Royal Air Force.

His Royal Highness The Duke of Gloucester attended the passing-out parade of No. 46 Entry of cadets, the first to complete a full post-war course.

On 1st August, 1951, Her Royal Highness The Princess Elizabeth, Duchess of Edinburgh, attended as reviewing officer at the graduation parade of No. 53 Entry and No. 4 Equipment and Secretarial Entry.

It was a proud moment for the cadets, and the whole Royal Air Force fully appreciate the honour that such an occasion brings to the Service.

New Chapel of Remembrance at Biggin Hill

Air Chief Marshal Lord Dowding, who was Air Officer Commanding-in-Chief, Fighter Command, during the Battle of Britain, laid the foundation stone of the new Memorial Chapel at R.A.F. Station, Biggin Hill, Kent, on Wednesday, 25th July.

The chapel will replace the St. George's Chapel of Remembrance which was destroyed by fire in December, 1946, and will be a memorial to the 453 pilots from the Biggin Hill sector of No. 11 Group, Fighter Command, who lost their lives in the war. The names of the fallen will be inscribed on panels in the chapel. The rebuilding has been made possible largely by the generosity of relatives and friends of the fallen, who subscribed over £6,000.

The building will be of brick, and, as in the original chapel, will include a George Room for quiet relaxation at the west end, separated by curtains from the chapel proper.

After the laying of the foundation stone a short service was conducted by the Chaplain-in-Chief of the Royal Air Force, Canon L. Wright. Among those present at the ceremony were Mr. Aidan M. Crawley, M.B.E., M.P., Under-Secretary of State for Air, Air Chief Marshal Sir Leslie Hollinghurst, K.C.B., K.B.E., D.F.C., Air Council Member for Personnel, and Air Marshal Sir Basil Embry, K.B.E., C.B., D.S.O., D.F.C., A.F.C., Air Officer Commanding-in-Chief, Fighter Command.

Air Support Demonstration in Malaya

At Kluang, in Central Malaya, 300 Army, Police and Security Force spectators, including the G.O.C., Malaya, Major-General R. E. Urquhart, recently saw a spectacular exhibition of offensive air support tactics, carried out with live bombs, rocket projectiles and cannon fire, by all types of aircraft in use by the R.A.F. against the bandits. The demonstration, staged in a natural amphitheatre surrounded by hills, consisted of five events.

First, a Lincoln bomber of the Royal Australian Air Force made an attack with 500-lb. bombs on a jungle area lying across the valley. This was quickly followed by a R.A.F. Sunderland flying-boat blanketing the same area with 20-lb. fragmentation bombs. Brigand light bombers dived into the amphitheatre

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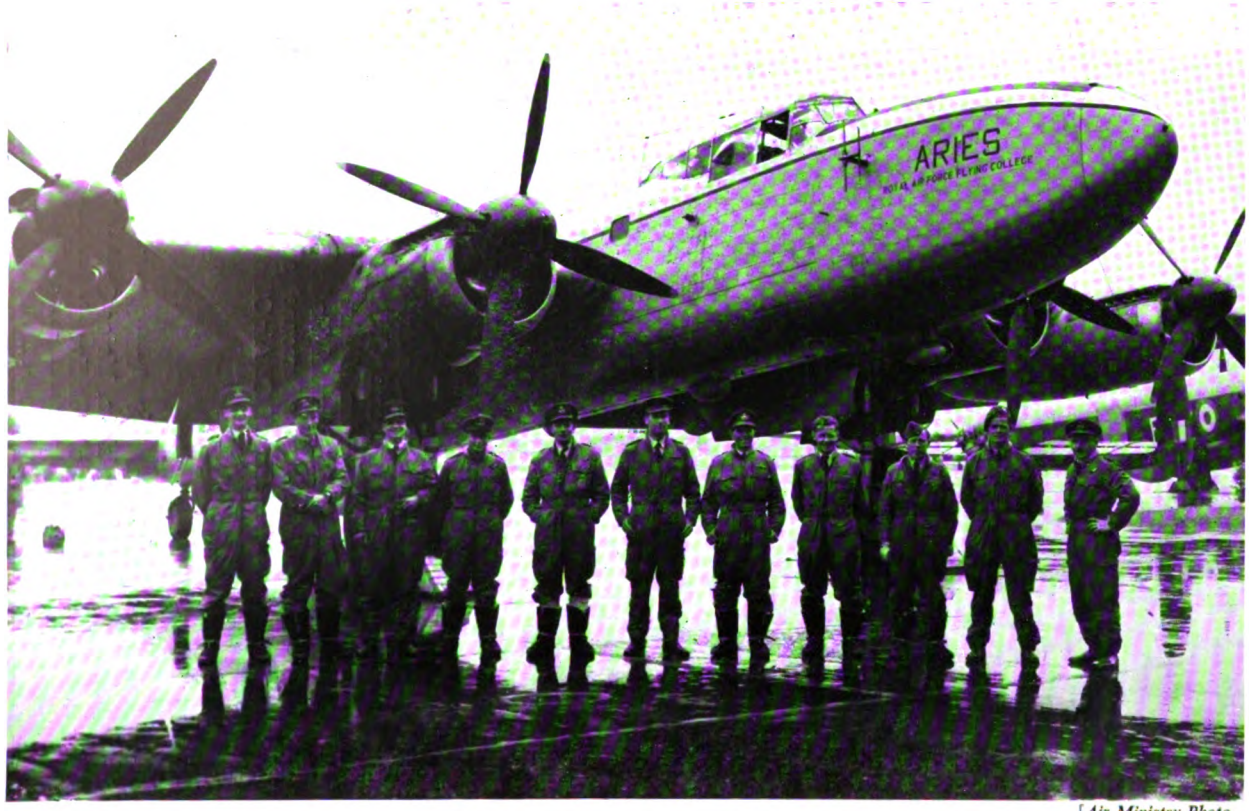

[Air Ministry Photo

FLIGHT OVER THE NORTH POLE

The captain, pilots and crew in front of the Lincoln "Aries," in which they recently flew over the North Pole

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next, to blast with rockets a concentration of old motor vehicles assembled not far from the spectators' enclosure. Twin-engined Hornet fighters, making one of their first appearances in Malaya, then made another rocket attack on a similar target.

The programme ended with Vampire jet fighters speeding in low over the hill-tops to attack with rockets, first a dummy road convoy and then a line of dummy huts specially built for the occasion.

Each demonstration of the use of air power in close support was preceded by a short lecture from a specialist officer of the R.A.F.

The demonstration was staged to introduce to the Security Forces the new Vampire and Hornet fighters allocated to the R.A.F. in Malaya.

R.A.F. Arctic Training Flights

Five aircraft of the Royal Air Force Flying College, Manby, Lincs, recently undertook a series of Arctic navigation training flights. In the course of one flight the Lincoln "Aries" flew over the geographical North Pole. Keflavik, Iceland, was used as an advanced base, and a ground party from Manby flew there in a Hastings transport aircraft to service the Lincolns and to help co-ordinate the flight arrangements.

The "Aries," a modified long-range version of the Lincoln bomber, carrying 4,600 gallons of petrol, left Keflavik in the early morning, packed with Arctic clothes, sleds, skis, rifles, fishing gear, axes, portable radios and concentrated foods, in case of an unforeseen forced landing in the icy wastes. On the journey the aircraft ran into icing conditions, but according to the captain of the "Aries," Wing Commander R. T. Frogley, "it was beautiful and dry at the North Pole." Passing over the North Pole, the aircraft's compasses pointed due south, drawn by the magnetic pole 1,500 miles away in islands north of Canada. Sandwiches and hot drinks, prepared on a heater, helped to keep the crew warm through the numbing cold of their Arctic flight. As the Arctic day lasts several months during the northern summer, the whole flight took place in daylight. The three navigators, Squadron Leader Mitchell, Flight Lieutenant Jillings and Flight Lieutenant Grocott, had to face many tricks of the compass, radio blackouts and drifting ice with no landmarks.

After a flight of seventeen hours, the "Aries" was landed at the U.S.A.F. base at Eielson Field, Alaska, having completed a non-stop flight of 3,553 miles.

Mines and Battle Wreckage still Surround El Adem

Not many miles from Tobruk, on the Cyrenaican coast, lies El Adem, one of the most unusual of the lonely staging posts which the Royal Air Force maintains in the Middle and Far East, as stopping places for its aircraft flying the long air routes between the United Kingdom, Egypt, India and Singapore.

Third in a chain of three such posts operating at intervals of several hundreds of miles in the Libyan Desert provinces of Tripolitania and Cyrenaica, El Adem stands amid one of the biggest unexploded minefields in the world. Around it lie littered piles of British, German and Italian wreckage from the days of the great desert campaigns. Windows and fittings of the R.A.F. Station are frequently shaken by explosions as, for one reason or another, mines blow up in the desert. The station itself is perfectly safe, having long ago been cleared of mines, and wandering off into the desert beyond the station perimeter is forbidden.

Although Ed Adem's primary function is to care for visiting aircraft and their crews and passengers, it also maintains a desert rescue team of officers and

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[Photo: The Glenn L. Martin Company

The United States Navy's newest anti-submarine weapon, the Martin P5M-1 Marlin flying-boat

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men, ready to drive, at short notice, to the help of victims of crashed aircraft and, where possible, salvage the aircraft. On these occasions maps indicating the safe paths through the minefields are used.

The U.S. Navy's Newest Anti-Submarine Weapon

The picture shows the United States Navy's newest, and one of its most deadly, anti-submarine weapons, the Martin P5M-1 Marlin flying-boat, taking-off from the waters of Chesapeake Bay on its first flight. A "substantial number" of Marlins are being built for the U.S. Navy. Power is provided by two Wright turbo-compound engines, each developing 3,250 horsepower. Equipped with the latest electronic devices for the detection of submarines, the Marlin also carries the lethal blows with which their discoveries can be destroyed. She has a long streamlined hull, the keel being under water from near the bow to the stern-post, and "hydroflaps," underwater rudders near the tail, aid in manœuvring in restricted waters.

U.S.A. Orders Night Intruder Version of British Jet Bomber

The United States Air Force's version of the English Electric Canberra bomber which is being built under licence in America by the Glenn L. Martin Co. will be used as a night intruder.

It will be fitted with a gun-sight and fixed forward-firing guns (the Canberra has no guns) for attacking ground targets. There will be a small tail-housed parachute brake for operation from small airfields and the bomb-bay will be redesigned to take a larger number of smaller bombs. The fuel tanks will be changed to take the American fuel, JP-3. Engines for the B-57A (as the U.S.A.F.'s Canberra is called) will probably be the British-designed J-65 Sapphires.

Naval Jet Fighters for France and Australia

Two overseas countries, France and Australia, have placed orders for Britain's latest carrier-borne all-weather jet day and night fighter, the de Havilland Sea Venom. The size of the orders is not announced. The Sea Venom is already in quantity production for the Royal Navy: it carries a crew of two—pilot and navigator/radar operator—has swept-back wings and special radar equipment in the nose. The wingtip tanks, to increase range, are designed so that they do not affect manœuvrability and speed. The engine is a de Havilland Ghost turbojet, rated at 5,000-lb. thrust.

Landing Caterpillar-wise

A caterpillar undercarriage, like a very small version of the wheels on an Army tank, has been fitted to an Auster aircraft, one of the lightest aircraft built in Britain. The caterpillar gear allows the light plane to take-off and land from small, rough airfields. In place of the ordinary two-wheel undercarriage, it has eight light-weight wheels, a set of four each side, each set connected by an endless rubber belt. Each wheel has independent suspension.

When the aircraft is taxying or landing on a rough airfield, the long, light-weight caterpillar track bends itself into the shape of the ground. It absorbs shock much more easily and the weight is distributed over eight wheels instead of the conventional two. Landings on a rough airfield can be made in about three-fifths of the normal distance and the Auster can make a much firmer landing when coming in to a small airfield across the wind.

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Replacing the ordinary two-wheel undercarriage of the light aeroplane by a caterpillar track can be done very quickly. Work on the Auster adaptation was completed by one mechanic in half a day.

Canadian and American Cadets Visit Britain

A contingent of the United States Civil Air Patrol (the American equivalent of the A.T.C.) and 25 Canadian Air Cadets recently paid a visit to the United Kingdom. The former visited Cambridge, the U.S.A.F. Station at Lakenheath, the R.A.F. College, Cranwell, followed by a four-day tour of Scotland, including visits to Edinburgh, Glasgow and Balmoral.

After flying from Edinburgh to Chester, where they lunched at No. 63 Group Headquarters, they continued their tour by road, visiting Worcester, Cardiff, Cheltenham and Oxford, and at White Waltham took part in the A.T.C. Rally. After the rally they included in their visits Brighton, the Isle of Wight and Uxbridge. Whilst at the latter station they took the opportunity of seeing the Festival of Britain South Bank Exhibition, the Festival Gardens and Fun Fair, Westminster Abbey and the Houses of Parliament.

The Canadian Air Training Cadets, after arriving by air at Lyneham, made their first visit that to one of their own R.C.A.F. squadrons, at Odiham. Their subsequent road tour included Oxford, Stratford-on-Avon, Shrewsbury, through Central Wales to Barmouth, Rhyl, and on to Chester, from where they were flown to White Waltham to join the others at the A.T.C. Rally.

After visiting Windsor Castle and Eton College they carried out a similar programme to that of their American comrades in London. A tour of Scotland, a visit to York by air and then on to Northolt, which came at the end of their visit to Britain. By the time both parties have arrived back in their own countries they may have had time to recollect at least some of the many things they have seen.

Jungle Rescue Team's Realistic Exercises

Members of the R.A.F., Changi (Singapore), jungle rescue team, who are always on call to locate aircraft that may have made forced landings in the jungle and to take supplies and aid to the crew or passengers, recently held exercises under realistic conditions on a small, uninhabited, jungle-covered island in the Bunting Group, off the coast of North Malaya, twenty-five miles north of Penang. In addition, they also assisted in armament trials on the island, where they stayed for a fortnight.

The exercises consisted mainly of reaching certain pin-pointed positions chosen on account of their difficulty of access or the ruggedness of the country between the base and the object of the search. The team had to clear with machetes tracks through stretches of both primary and secondary jungle and progress at times was extremely slow as they hacked their way through dense undergrowth.

The treatment of "casualties" and their transport on stretchers improvised from ground-sheets and branches of trees was also gone into in detail. Valuable first-hand experience in this matter was fortuitously gained by frequent showers of torrential rain, which reduced the tracks to quagmires, so that the removal of the "casualties"—represented by large and heavy blocks of wood—became extremely difficult.

Experience was also gained in operating in jungle for long periods in full kit, and carrying wireless equipment, arms and ammunition.

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8,500-Mile R.A.F. Survey by Valetta Transport Aircraft for Jet Flights to South Africa

As the result of an 8,500-mile R.A.F. survey flight from the Suez Canal Zone to Pretoria and back which has recently been made in a Valetta transport aircraft, jet aircraft may one day stage through airfields in the remotest parts of the African continent. Some of the airfields visited lay in complete wilderness, miles from civilization, and were operated almost entirely by natives, who acted as ground crew and refuelled the Valetta.

The route crossed Egypt, the Sudan, Kenya and Northern and Southern Rhodesia. Lindi and Dar-es-Salaam (Tanganyika), Mombasa (Kenya), Mogadishu (Italian Somaliland), Hargeisha (British Somaliland), Aden and Port Sudan were among the places visited. The flight was completed within a few hours of the fortnight allotted it.

Two United Kingdom officers taking part and who went to the Canal Zone specially for the surveys were Wing Commander E. C. Badcoe, D.F.C., Transport Command, and Squadron Leader L. G. Martin, Air Ministry. They were accompanied by two officers from Headquarters, Middle East Air Force, Wing Commander T. W. Piper, O.B.E., A.F.C., and Wing Commander A. A. Fletcher. Also in the party were the Officer Commanding a Vampire squadron in the Canal Zone and Captain K. C. Kuhlmann, D.F.C., of the South African Air Force. The Valetta was provided by R.A.F. Station, Fayid.

While in South Africa the R.A.F. officers enjoyed the hospitality of the South African Air Force and lived in the S.A.A.F. Mess at Zwartkop, the original Mess of the General Officer Commanding the Occupation Forces after the Boer War.

Pageant of "Fifty Years of Flying"

Recently the Royal Air Force took part in the pageant of "Fifty Years of Flying" at the Royal Air Force Station, Hendon. The variety of aircraft in the ground exhibition indicated clearly the incredible progress that had been made. The older types no doubt stirred up memories, both pleasant and not so pleasant, in those who "juggled with death" in them in the days of long ago.

R.A.F. Ex-Service Men as Yeomen of the Guard

When visitors to St. James's Palace see a Yeoman of the Guard on duty, few would realize that he might be a former member of the Royal Air Force. Airmen who have completed twenty-one years' total Regular service are eligible for acceptance as Yeomen, as are soldiers and marines with a similar length of service.

Candidates are required to have reached the rank of warrant officer, flight-sergeant, chief technician, sergeant or senior technician and to be of "very good" character, under 50 years of age, and in possession of at least one medal for active service. Physically, they are required to be not less than 5 ft. 10 in. in height and 36 in. round the chest.

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[*National Defence Photo, Canada*

Canada's contribution to the North Atlantic Pact is the training of **N.A.T.O. air crews.** *Five European countries are represented at various training* **stations across the** *Dominion, in addition to R.A.F. and R.C.A.F. trainees. Here,* **a Netherlands student** *climbs aboard a Harvard trainer at Centralia, where the first* **N.A.T.O. pilots received** *their wings recently*

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OUR COMMONWEALTH AIR FORCES

ROYAL CANADIAN AIR FORCE

THE R.C.A.F. TODAY

THE Royal Canadian Air Force is today in the midst of its greatest peace-time expansion programme, a programme aimed at producing a modern fighting force boasting some forty squadrons, flying aircraft ranking among the world's finest and working with the latest equipment.

The Air Force build-up is part of a five-billion-dollar, three-year scheme for expanding Canada's defence forces. In addition to providing for aerial defence of North America proper, it provides for substantial contributions to collective security, both in the form of actual fighting units stationed abroad and training aid here in Canada.

On the foundation laid in earlier post-war years is rising a R.C.A.F. several times the size of the Force immediately planned after the war's end. Large contracts have been placed for new Canadian-built jet fighters and large numbers of war-time aircraft have been removed from storage. Contracts are being placed as quickly as possible to speed up the R.C.A.F. programme of new operational and training sites. New squadrons are being formed as quickly as aircraft can be obtained, and taking form also is the radar early warning and ground control system vital to successful fighter defence operations against enemy bombers.

Main emphasis by the R.C.A.F. is being placed on interceptor fighters, and the majority of the forty squadrons planned for the Regular and Reserve Forces are to be fighter squadrons. The Sabre, the R.C.A.F.'s standard day fighter, is replacing the Vampire jet in limited service for several years. The Canuck two-seater, powered by two jet engines, is an all-weather long-range fighter, particularly suited to Canadian conditions.

Also being increased is the number of maritime squadrons, whose duties include coastal patrol work and general naval co-operation operations. Present plans do not call for maintenance of a strategic bombing force, although the Service is keeping abreast of developments in this field. Present extensive transport services are being maintained.

The R.C.A.F. is working closely with the United States Air Force in general plans for defence of the North American continent, with much resultant standardization of equipment and procedures. In addition, the R.C.A.F. expansion plans are tied in closely with over-all plans for collective security.

Canada's contributions to collective security have already begun to take concrete shape. One hundred aircrew trainees from Norway, the Netherlands, Belgium, France and Italy were awarded pilot and navigator wings at R.C.A.F. training schools in May and June, 1951.

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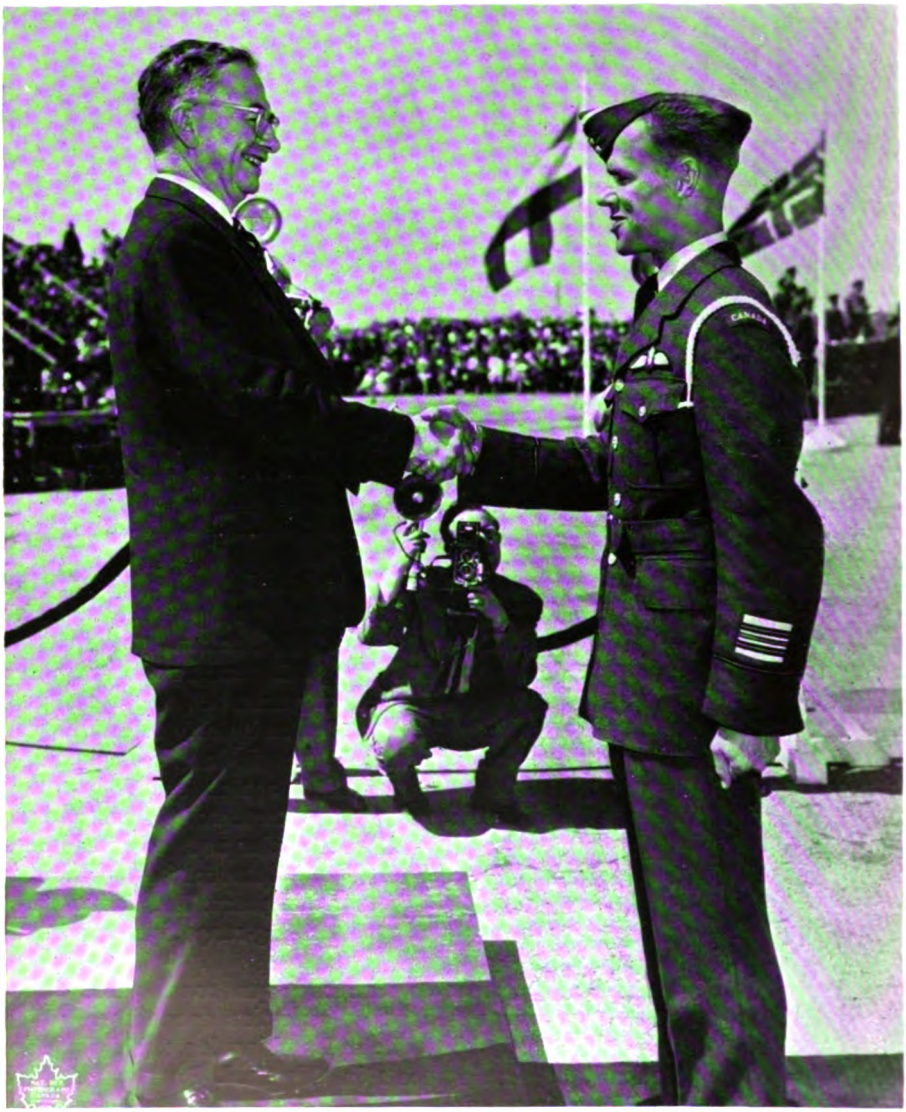

[National Defence Photo, Canada

*Defence Minister Brooke Claxton congratulates Flight Cadet (now **Pilot Officer**) B. Ingall, of Montreal, as he presents the J. D. Siddlet Trophy for flying proficiency, during the first N.A.T.O. wings parade for pilots held at **R.C.A.F. Station**, Centralia, Ontario*

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The first of an announced total of over 1,300 R.A.F. student aircrew arrived in Canada in January, 1951, and are being trained at R.C.A.F. schools.

Over-all R.C.A.F. aircrew training plans, including R.C.A.F. requirements together with aircrew from abroad being trained here, call for more than 3,000 personnel to be under training annually. Training of this number of aircrew, of course, is dependent on opening of new training schools which are scheduled to begin operations this year and next.

In addition to training assistance, the first of a projected total of eleven fighter squadrons from the R.C.A.F. destined for overseas service arrived in the United Kingdom in January, 1951. This squadron, No. 421, will be flying and training with the R.A.F. throughout the year.

Since July, 1950, the R.C.A.F.'s 426 Thunderbird Squadron, flying North Star transports, has been taking an active part in the Pacific airlift, carrying troops and material between the U.S. West Coast and Japan.

The rapidly expanding Regular Force is backed by a growing Reserve, which includes both squadrons engaged on flying operations and ground training units. Special stress, as regards the ground units, is being placed on radar early warning squadrons, which are being formed across Canada.

Training for members of a Reserve unit is on a part-time basis and members are able to attend summer camp for two-week periods in addition to normal training throughout the year. Reserve units take part in many schemes and exercises with other such units or with Regular Force formations. Some of the Reserve exercises have been carried out with Reserve units in the United States, an outstanding example being Exercise "Metropolis," which saw Montreal units moving to New York City to take part in a mock aerial defence operation.

Well under way is the R.C.A.F.'s "Chipmunk Scheme," a refresher flying training programme handled on a reserve basis. Up to 600 veteran pilots are being given refresher flying and ground training annually, in order to maintain a pool of potential flying instructors and staff pilots, ready to serve in emergency with a minimum of delay. Chipmunk training aircraft are supplied to flying clubs across Canada by the R.C.A.F., and actual instruction is given by the flying clubs, costs being met by the Air Force.

Recruiting of women for various R.C.A.F. trades is to begin this summer, with emphasis being laid initially on electronics trades and other duties connected with the radar early warning system and fighter control operations. Women recruits will fit into the general personnel pattern and there will be no separate corps or women's group. Pay will be the same as for men in equivalent ranks and commissions will be open to qualified personnel.

Unique in the R.C.A.F. training programme is the Survival Training School, which operates at Fort Nelson, B.C., and Cambridge Bay, N.W.T., within the Arctic Circle. Service aircrew are instructed in methods of bush and Arctic survival, training being given by experienced R.C.A.F. men, with Eskimos and Indians assisting. Ultimate aim of the school is to train all R.C.A.F. aircrew actively engaged in Northern flying in survival techniques. Establishment of the school is indicative of the importance placed by the Service on "know-how" when it comes to the question of an aircraft's crew downed in the North.

In addition to fitting itself to serve as an efficient defence force, the R.C.A.F. has various "peace-time" tasks which serve the public interest and which at the same time give personnel operational training, in addition to their purely military value.

Largest of these, in respect to numbers of aircraft and men involved, has been

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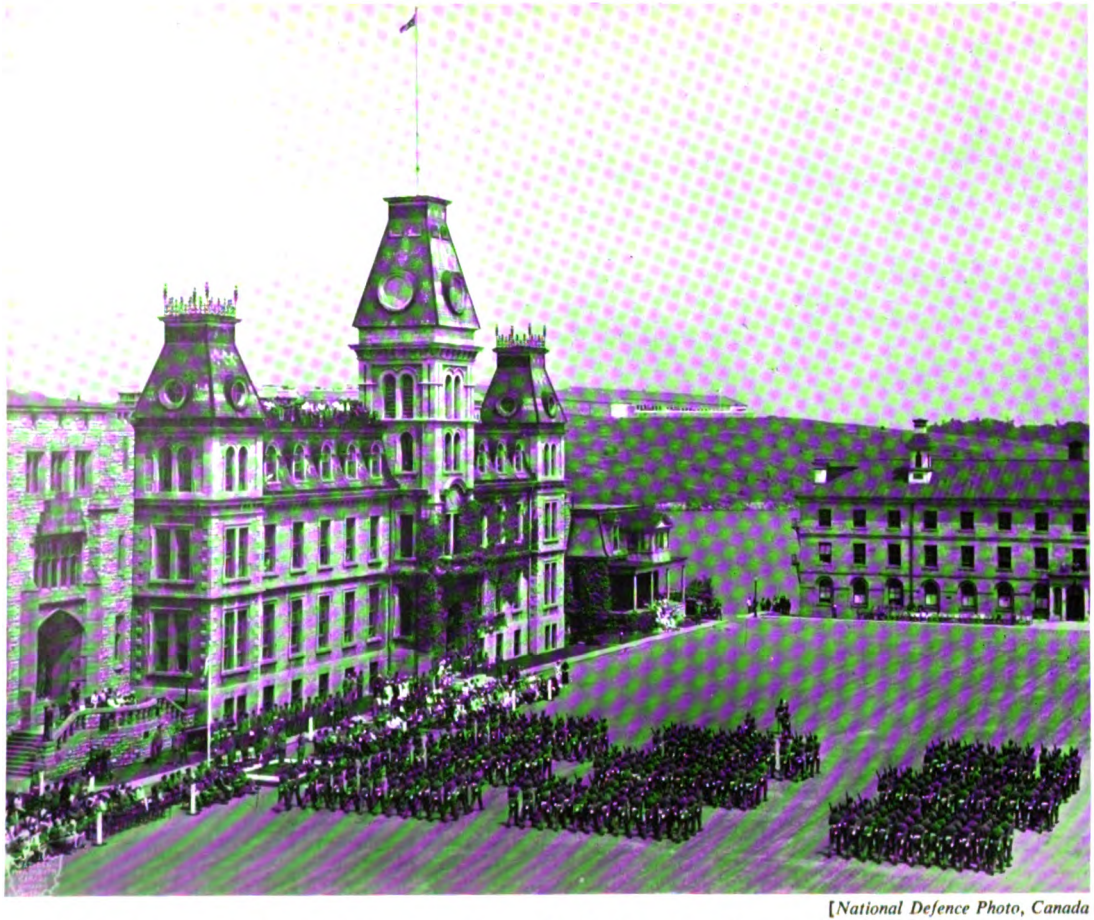

[*National Defence Photo, Canada*

High-angle view of wing march past in review order during graduation ceremonies for 400 university flight cadets from Reserve Officers' School, at R.M.C., Kingston

the aerial photographic coverage of Canada, carried out by photo squadrons based at Rockcliffe, Ontario, near Ottawa.

Important, too, are the peace-time responsibilities of the R.C.A.F.'s Search and Rescue Organization. Born of the war-time Air/Sea Rescue units, the present organization was set up as a permanent agency following the war.

Canadian geographical conditions place special stress on air transport in the Dominion, and widespread operations of this type are carried out by Air Transport Command. An increasing amount of Northern flying is being done by the R.C.A.F., involving numerous supply flights into the Far Arctic.

Transatlantic training flights or special operations have become routine for the big North Stars operated by A.T.C., and 426 Squadron, flying the Pacific airline, comes under this Command.

Closely connected with the R.C.A.F. are the two Canadian Service Colleges, Royal Roads, near Victoria, B.C., and Royal Military Academy, at Kingston, Ontario. These two schools are operated on a tri-Service basis, training young men as officers for the Armed Forces.

The R.C.A.F. maintains a Staff College in Toronto, where officers qualify for staff positions. Advanced instruction to senior officers is given at the National Defence College, Kingston, Ontario, which is attended by officers of all three Services, and by selected senior civil servants and representatives from industry.

The R.C.A.F. is associated with Canadian universities through an undergraduate reserve training programme. Selected undergraduates are given three consecutive summer flying or ground training courses with the R.C.A.F., and on successful completion of this programme, and graduation from university, the undergraduate may be offered a commission in the Regular Air Force or the Reserve. Those taking flying training receive their wings as pilots, navigators or radio officers at the end of their third summer training period. Air Force Flights, comparable to the Army's C.O.T.C. units, have been formed at nine major universities, and Air Force training on a part-time basis is given throughout the school year to members.

Also closely associated with the R.C.A.F. is the Air Cadet League of Canada. The League operates squadrons across Canada, with a maximum approved enrolment of 22,500. The squadrons are administered by the Air Cadet League, a civilian organization, but are equipped by the R.C.A.F., which assists with their training.

Although not a component of the Air Force, the R.C.A.F. Association, formed in 1948, is closely connected with the Service. Having among its aims the "support in Canada of an adequate and efficient Air Force for the defence of our country," the Association has expanded across the country during the last year, forming local wings in many centres. Membership is made up of Air Force veterans.

Today's R.C.A.F. is a proud Service, with proud traditions. Its members, those with war-time experience and those younger men entering from school and civilian life, are showing in many ways that the high standards set before and during the last war are being maintained. They are highly skilled and efficient, deserving the best in aircraft and equipment. It is the policy of the Department of National Defence to provide them with this. Much has been done, and much is being done, and although the R.C.A.F. will not be the world's largest Air Force, it will be of sufficient size to command respect as a fighting force. In quality it ranks—and will continue to rank—second to none.

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[Photo: Gale & Polden Ltd., Aldershot

BEAGLES, R.A.F. CADET COLLEGE, CRANWELL, DECEMBER, 1928

Sergeant J. Burns (kennelhand), Flight Cadet Corporal K. L. Coates, Flight Cadet R. L. Phillips, Flight Lieutenant H. C. Pyper, Air Vice-Marshal F. C. Halahan, C.M.G., C.B.E., D.S.O., M.V.O., Flight Cadet G. K. Fairclough and Aircraftman R. P. Osborne

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PER ARDUA AD BEAGLING

By Group Captain L. G. Levis

I HAD often thought what fun it would be for the Royal Air Force to have a pack of beagles of its own once again, and I decided that if ever I commanded a station in a good beagling country I would have a shot at forming a small pack run on self-help lines. Imagine my pleasant surprise, therefore, when I was appointed to Cranwell in November, 1950, to form and command a new Initial Training School. Here, it seemed, would be a great opportunity to put my plan into action, particularly as my Commander-in-Chief's last words to me before I left Headquarters, Flying Training Command, were: "Oh, and if you get the chance, start up those beagles again." I did not need telling twice.

The Cranwell Beagles which had been so successful under Flight Lieutenant H. C. Pyper (now Wing Commander (retired) and whipping-in to the Beacon Beagles, to which he is Secretary), had been disbanded in 1936, and hounds sold to the Wick and District Bassett Hounds. When I arrived at Cranwell in November I immediately turned to the inimitable Harry Lager for assistance so that I could pick up the threads of the original Cranwell Beagles for guidance in my now project. Harry Lager produced a few old balance sheets from the archives, but beyond these and a battered photograph of the pack taken on the lawn of the Lodge in 1928 there were no traces to be found. Even the kennels had been destroyed. As far as I could see I should have to start from scratch.

I may say the balance sheets were far from reassuring, but as I had made up my mind that any new pack which we might form would be run on a self-help system without professional assistance, I purposely turned a blind eye to the alarming figures, knowing that the longer I looked at them the less likely I was to form a pack.

In the meantime I had been in touch with the Master of the Radley College Beagles as I had been impressed by the way in which they ran their small pack entirely without professional help of any sort. The reply I had from Radley had been sufficiently encouraging to confirm that what I was proposing was possible and was not just wishful thinking, provided I could find a nucleus of enthusiasts to carry the pack through the difficult period of its formation. I approached the A.O.C. Cranwell and, obtaining his approval in principle, I started the ball rolling by writing to the Masters of the Belvoir and Blankney Foxhounds for their blessing, since most of our hunting would be carried out in their respective countries. This was quickly forthcoming, and the way seemed clear to go ahead.

As there were no kennels, it was my intention to convert the old Cranwell Hunt Club stables to serve in the office of kennels, and to this end we made plans.

Of course we needed some money to start a pack, and I approached the R.A.F. Sports Board. It was then that the idea of a Royal Air Force Beagling Association was conceived. Until that time I had viewed the whole project as a local pack purely for the benefit of Cranwell. It was suggested by the Sports Board that the pack we were forming at Cranwell should be regarded as an R.A.F. regional pack which would endeavour to show sport to as many Royal Air Force establishments as possible in the area. Thus the pack formed at Cranwell would be a truly R.A.F. pack. Although kennelled at Cranwell, it would not belong to any particular station.

The possibilities of the scheme were far bigger than I had ever imagined, and I viewed the project with enthusiasm. It was agreed, therefore, that we should form the first pack of the Association at Cranwell with the intention of setting

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up packs in other areas if the Cranwell pack was successful. With this new conception, the R.A.F. Sports Board generously gave me financial support to cover initial capital expenditure and to run the pack for the first season. After that we were to be self-supporting.

As soon as the project became generally known at Cranwell and in the neighbourhood there was a natural tendency to regard this new pack as the "Cranwell Beagles." It seemed necessary, even at this early stage, to give the pack a name which embraced the whole R.A.F., thus giving it a Royal Air Force flavour as opposed to a purely local one. The difficulties of forming such a pack, and the very nature of the sport itself, suggested that the name "Per Ardua" would not be inappropriate, the more so since it had become evident that the old stables were entirely unsuitable for our purpose and that we should have to build our kennels as well!

The response to a personal letter to all officers at Cranwell seemed encouraging enough for me to press on with the project. A small team of volunteer builders was formed under Flight Lieutenant R. C. Barlow, of No. 3 I.T.S., and a rough (very rough) plan was drawn up for the kennels. A site was chosen next to the camp sewerage works, where it appeared that water and drainage could easily be laid on, and early in April the first sod was turned. All work has been done in spare time, mainly in the evenings, and very gradually the kennels have taken shape.

In the meantime I had been in touch with several Masters of Beagles in an endeavour to collect suitable hounds, and the response was such that I was obliged to take delivery of three couple of hounds early in June before the main kennels were anywhere near ready. This necessitated building some temporary kennels in the back garden of my quarter in order to house the first "intake." It was not unlike the Festival of Britain, and three of us just managed to have adequate kennels of a sort finished in time. An interesting feature of this draft

[*Photo: L. P. V. Carter, Dovercourt*

Group Captain Levis with beagles. "Wicklow" is on the extreme right. "My terrier, 'Plonk,' accompanies us on all our exercising. He is the little white fellow in the middle. Time, 0630"

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was a young hound called "Wicklow," whom I obtained from the Beacon through the good offices of Wing Commander Pyper. Indeed, "Wicklow" was the first hound I collected and it seemed fitting that it should be so.

From the moment I collected this first draft I was committed to exercising and feeding them whilst the rest of my team carried on with the building of the main kennels. In due course I was joined by Flight Lieutenant Bell-Williamson and Squadron Leader Crisfield on my early morning exercise sorties, and between us we ran a regular routine; we would leave base at 0630 hrs. daily for approximately one hour's exercise, first on foot and later on bicycles. Feeding was carried out after tea. Each week-end the kennels and runs had a thorough "doing."

I longed to increase the number of hounds, but this was impossible until the main kennels were ready. Eventually, by the end of July, I was able to take delivery of a draft from the Newcastle and District; a further draft was obtained from the Royal Navy pack, The *Britannia*, in early August, and by mid-August, with a draft from the Catterick, we were up to our planned "peak intake" of eleven couples. Naturally, like all new projects in the R.A.F., the "phasing of intakes" had not gone quite according to plan, and I must say that the various packs, who had promised us hounds, were most sporting in the way in which they kept hounds destined for the Per Ardua in their kennels until we were ready.

I personally was delighted that both the Navy (*Britannia*) and Army (Catterick) were represented in our new pack. For those who are interested in the sartorial side of the hunt, the uniform is to be traditional green coat with light blue collar, appropriately engraved (P.A.B.), gilt buttons, yellow or buff waistcoat, white breeches and C.F.S. blue stockings (if procurable) and black velvet cap.

The pack is registered with the Association of Masters of Harriers and Beagles and is, therefore, an officially recognized pack in the eyes of the beagling world.

It is the aim of the R.A.F. Beagling Association to encourage and foster beagling as a healthy recreation wherever it is possible for members of the Royal Air Force to enjoy this sport. Given adequate support it should be possible to build up R.A.F. packs in other parts of the country. Beagling run on these lines is well within the purse of all ranks of the R.A.F., and a well-run pack can engender a great spirit of *camaraderie* from air marshal to airman. Those of you who have been thinking of beagling do please get in touch with your local pack. You will always be welcome. The fellowship of beaglers is one of the friendliest in the world. If you do not know how to set about it please contact the Secretary, R.A.F. Beagling Association, 3 I.T.S., R.A.F., Cranwell, Lincolnshire, and he will put you in touch with your local pack and give you advice concerning dress, etiquette, etc.

If any station is thinking of having its own pack, do please approach the Association first. We can save you making all the mistakes we have made. At any rate we have almost a year's experience behind us and we can advise you on a number of points. If we do not know the answer, we will take steps to find it for you.

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SPORT IN THE R.A.F.

[*Photo: Gale & Polden Ltd., Aldershot*

The R.A.F. Equitation Association team at the Royal Tournament being presented to Her Royal Highness The Princess Elizabeth

THE ROYAL AIR FORCE EQUITATION ASSOCIATION

THE Headquarters and Home Counties Branch is now well established at Royal Air Force Station, Halton, where eleven horses and one pony are stabled. Active membership from Royal Air Force Station, Halton, alone has increased to 116, of which 109 are airmen. Members from Headquarters, Fighter Command, Headquarters, No. 24 Group, and Headquarters, Coastal Command, are regular weekly visitors on allotted afternoons. Jumping classes are held on Tuesday evenings for beginners and on Thursday evenings for more experienced members. A full show-jumping course and a cross-country course are available.

The Wiltshire Branch of the Association has been opened at Royal Air Force Station, Yatesbury.

Training facilities were provided for Royal Air Force entrants for the equitation part of the Inter-Services Modern Pentathlon.

The Royal Air Force Modern Pentathlon was held at Halton in August, and the Royal Air Force Equitation Association provided the horses for the equitation portion of the pentathlon held over the cross-country course at Halton on 27th August, 1951.

The following team represented the Royal Air Force Equitation Association at the Royal Tournament this year in the jumping for the Prince of Wales's Cup: Sergeant R. J. H. Saunders, R.A.F., Little Rissington, Sergeant P. Duncan (W.R.A.F.), Headquarters, Home Command, and Aircraftman I. Portlock, Headquarters, No. 24 Group.

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Flight Lieutenant Smith and Aircraftman Portlock, both of Headquarters, No. 24 Group, have represented the Association in jumping events at the following gymkhanas: Rickmansworth, Bletchley, Pinner, High Wycombe, Wendover, Coleshill, Henley-in-Arden and Tamworth.

Encouraging successes were achieved at the last three over the August Bank Holiday week-end—two firsts and a tied first in open events and a first and a third in Class "C" events.

The annual gymkhana of the Association was held at Halton on Wednesday, 19th September. A preliminary gymkhana was held at Halton on Wednesday afternoon, 9th May, and was much enjoyed by all members and visitors present, despite unfavourable weather.

Members at all branches of the Association are asked to assist the Secretary of the Association by forwarding their subscriptions promptly when due. It is hoped that other horse-lovers in the Royal Air Force will assist the objects of the Association by joining or by sending a nominal subscription.

ADASTRIAN CRICKET CLUB IRISH TOUR

The Adastrian C.C. have recently completed their first Irish tour. They played matches against Cork County (two days), Carlow County (one day) and Leprechauns (two days).

The side was captained by Squadron Leader R. G. Wilson, D.F.C., this year's captain of the R.A.F. XI, and had amongst its members Squadron Leader A. C. Shirreff (last year's R.A.F. cricket captain) and Flight Lieutenant R. Leggett and Pilot Officer M. D. Fenner, members of this year's R.A.F. XI.

In the first match, against Cork County, the Adastrians scored 306 for 5 declared in 140 minutes, Flight Lieutenant Leggett hitting five sixes and twenty one fours while getting 158 not out in 100 minutes. Cork County were dismissed for 110 in the first innings, but rain prevented a finish.

The match against Carlow was played on a very natural wicket at a lunatic asylum in Carlow. The home side batted first and scored 152. After a few early shocks the Adastrians just managed to win by two wickets in failing light.

The final match against the Leprechauns, at Dublin, was won by the Adastrians rather easily. After scoring 282 for 7 declared (of which Pilot Officer K. Marsden scored 174 not out), the Leprechauns were dismissed for 148 and 147, leaving the Adastrians to get 14 runs to win, which they did after losing three wickets.

The tour was a great success in every way and it is hoped that it will be a permanent feature of the Adastrian fixture list.

Membership of the Adastrian Cricket Club is open to all serving and former officers of the Royal Air Force, and to past and present officers of the Royal Auxiliary Air Force, Royal Air Force Volunteer Reserve and Dominion Air Forces, and to cadets of the R.A.F. College. The subscription is only five shillings per year. The purpose of the club is to provide good-class club cricket for its members and so help raise the standard of cricket in the Royal Air Force.

Their fixture list includes fixtures against various public schools, London club sides, touring sides and Service sides. Next year more matches are to be played in the North of England, and branches of the club are being formed in formations abroad.

Applicants for membership are normally required to play one qualifying match, and full details can be obtained from the Secretary, Squadron Leader H. L. Lewis, Air Ministry (S.T.7), Metropole Buildings, Northumberland Avenue, W.C.2.

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366-MILE R.A.F. CYCLING "MARATHON"

The Royal Air Force Cycling Association's first cycling "marathon," consisting of seven time-trial stages, totalling a distance of 366 miles, took place in July. Teams were restricted to three riders from each R.A.F. station, and about fifty stations were represented.

The stages were from one R.A.F. station to another, starting from R.A.F. Station, Henlow, Bedfordshire, and finishing at R.A.F. Station, Halton, Buckinghamshire.

A cup was awarded to the rider completing the course in the fastest time, and the second, third and fourth fastest riders received plaques. The winning team was awarded a silver cup, to be held for a year. Members of the winning team and the second team were given plaques, and members of the third team received medals. The winner of each stage also received a medal. The seven stages were as follows:

2nd July.—R.A.F. Station, Henlow, to R.A.F. Station, North Luffenham, Rutland (56 miles).

3rd July.—R.A.F. Station, North Luffenham, to R.A.F. Station, Cranwell, Lincolnshire (41 miles); R.A.F. Station Cranwell, to R.A.F. Station, Newton, Nottinghamshire (25 miles).

4th July.—R.A.F. Station, Bottesford, Nottinghamshire, to R.A.F. Station, Cosford, Staffordshire (88 miles).

5th July.—R.A.F. Station, Cosford, to R.A.F. Station, Innsworth, Gloucestershire (64 miles).

6th July.—R.A.F. Station, Innsworth, to R.A.F. Station, Abingdon (54 miles); R.A.F. Station, Abingdon, to R.A.F. Station, Halton (38 miles).

[*Air Ministry Photo*

Competitors in the R.A.F. Cycling Marathon

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CUP PRESENTED TO M.E.A.F. SQUADRON IN OFFICER'S MEMORY

The parents and brother of a R.A.F. officer killed while flying in the Middle East in December last year have given a silver trophy in his memory to his former squadron—No. 249 (Gold Coast)—based in the Suez Canal Zone, for award to the winners of an inter-flight competition to be held twice yearly.

The donors are Lieutenant-Colonel and Mrs. L. C. Bull and Mr. D. C. Bull, parents and brother of Pilot Officer Walter Laurence Bull, who was killed while flying his jet fighter on cannon-fire practice over a Canal Zone range. This 21-year-old officer was a post-war graduate of Cranwell who was commissioned in April last year, six months before joining his squadron in the Middle East.

The trophy, a silver bowl on an ebony pedestal made to special order by Goldsmiths & Silversmiths Ltd., London, is to be awarded to the flight excelling in four branches of sport, rifle and revolver shooting, and drill and parade turn-out during the summer and winter seasons.

Cricket, basket-ball, tennis and swimming will be the summer season's sports, squash, hockey, soccer and seven-a-side rugby the winter events. The summer programme, which envisages one event being held each month, began on 1st June.

Except for the Squadron Commander and the Squadron's Engineer Officer, all Squadron personnel, both aircrew and ground personnel, are eligible to take part in the inter-flight competition.

INTERNATIONAL MILITARY AIR PENTATHLON

Two teams entered by the R.A.F. Modern Pentathlon Association represented Great Britain in the International Military Air Pentathlon, held at Namur, near Brussels, from 16th to 23rd July, 1951.

The R.A.F. teams were captained by Squadron Leader G. A. Podevin, of No. 1 Parachute School, Abingdon, who, with Flight Lieutenant L. S. Lumsdaine, of Headquarters, British Air Forces of Occupation (Germany), formed the "A" team. The "B" team was Squadron Leader W. Allsopp, Headquarters, Fighter Command, and Flight Lieutenant D. Oxborrow, of the School of Physical Training, Cosford.

Before entering for the pentathlon proper, each of these teams took part in an air rally, flying Devons over a course which was notified an hour before take-off. In this the British "A" team was second, the Dutch team gaining first place. In the pentathlon itself, consisting of pistol shooting, fencing, swimming, a series of basket-ball exercises and an invasion exercise preceded by an assault course, Flight Lieutenant Lumsdaine won the Individual Championship and also the Swimming Championship. The pistol shooting was won by Squadron Leader Podevin.

The R.A.F., representing Great Britain, won the pentathlon in 1949, was second in 1948 and third in 1950. This year the "A" team again secured second place, the French "A" team being first.

R.A.F. BEATS U.S.A.F. AT AERO-MODELLING

The British Air Forces of Occupation (Germany) Model Aircraft Association defeated the United States Air Force "Wings and Wheels" Club by 96 points to 63 in a contest held recently at Wiesbaden U.S.A.F. Base. The B.A.F.O. competitors were flown to Wiesbaden and back in a U.S.A.F. Dakota.

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BOOK REVIEWS

No. 5 Bomber Group, R.A.F. By W. J. Lawrence. Published by Faber & Faber Ltd., 24 Russell Square, London. 246 pp. and Index. Illustrated. 15s.

No. 5 Group, Bomber Command, began the war as one of four operational bomber groups then in service, distinguished from the others only by the fact that it was equipped with Hampdens. It ended the war as a great and formidable striking force equipped with the finest heavy night bombers in the world, and with a superb record of achievement, including some of the fiercest and most brilliantly conceived and executed actions fought by the Royal Air Force.

Whilst one cannot altogether share Mr. Lawrence's view that the crews of "No. 5" were imbued with a special, exclusive kind of bravery, skill and initiative which automatically singled them out for Bomber Command's most hazardous missions, it is a fact that this Group was chosen for a great many special tasks and that it always acquitted itself well.

Here, for example, are inside stories of the night raid on the Dortmund-Ems Canal which earned a Victoria Cross for Squadron Leader Learoyd; the gallant daylight attack on a U-boat engine factory at Augsburg by twelve Lancasters led by Squadron Leader Nettleton, V.C., from which only five aircraft returned; the breaching of the Mohne and Eder dams by Guy Gibson's dam-busters; the sinking of the *Tirpitz* and scores of other actions. The fact that they are usually described in the sort of prosaic language one associates with official communiqués, rather than "in glorious Technicolor," gives them added dignity and realism, for this is a historical record and not just a story book.

Here also is traced the war-time development of Bomber Command as a whole from a mixed day and night bombing force of light and medium bombers to an overwhelmingly powerful armada of four-motor "heavies." One can read how ineffective, scattered bombing with 250-lb. bombs gradually gave way to Pathfinder-led, concentrated assaults by hundreds of Lancasters and Halifaxes, carrying bombs weighing up to 10 tons each. The parallel development of aircraft, armament, bombs and radar is an integral part of the story, and one which Mr. Lawrence has handled in a satisfactory way, explaining the effect of each new device on the tactics and course of the war in the air.

No matter how factual and accurate it might be, a book of this nature would still lose much of its value if it failed to show *why* "No. 5" was able to achieve so much, for gallantry and fine equipment by themselves are not sufficient for victory. Fortunately, Mr. Lawrence gives the answer to this, too, for he shows how achievement was built on a solid foundation of rigorous training and the inspired leadership of Air Vice-Marshals Harris, Bottomley, Slessor, Coryton and Cochrane, all of whom commanded No. 5 Group Bomber Command before taking up their later and greater appointments.

J. W. R. T.

Round the Bend. By Nevil Shute. Published by William Heinemann Ltd., London. 362 pp. 12s. 6d.

Some three and a half years ago Nevil Shute wrote to James Riddell asking if the latter would like to accompany him on a flight to Australia and back in a Proctor light plane, with the object of collecting background material for new books *en route*. There could only be one answer to such a letter, and Mr. Riddell eventually published his impressions of the 30,000-mile journey in an enthralling book entitled *Flight of Fancy* (Robert Hale; 25s.).

Nevil Shute's first novel published after the flight—*A Town Like Alice*—had an Australian setting. It has now been followed by *Round the Bend*, which reflects a much wider knowledge of the Middle and Far East than its author could possibly have acquired in one return journey.

Like Nevil Shute's earlier novels, it deals with decent, human and simple people; and even though one of the chief characters develops through the years from a member of Alan Cobham's Air Circus into first a superb aircraft ground engineer and then a mystic, whose theories cause him to be accepted as a new prophet by thousands of followers in the East, the metamorphosis is described so sincerely and simply that it never seems larger than life.

Round the Bend has, perhaps, too strong an aeronautical flavour to achieve the tremendous universal popularity of *A Town Like Alice* and *No Highway*, but nobody with the slightest interest in aviation could fail to find it completely satisfying.

J. W. R. T.

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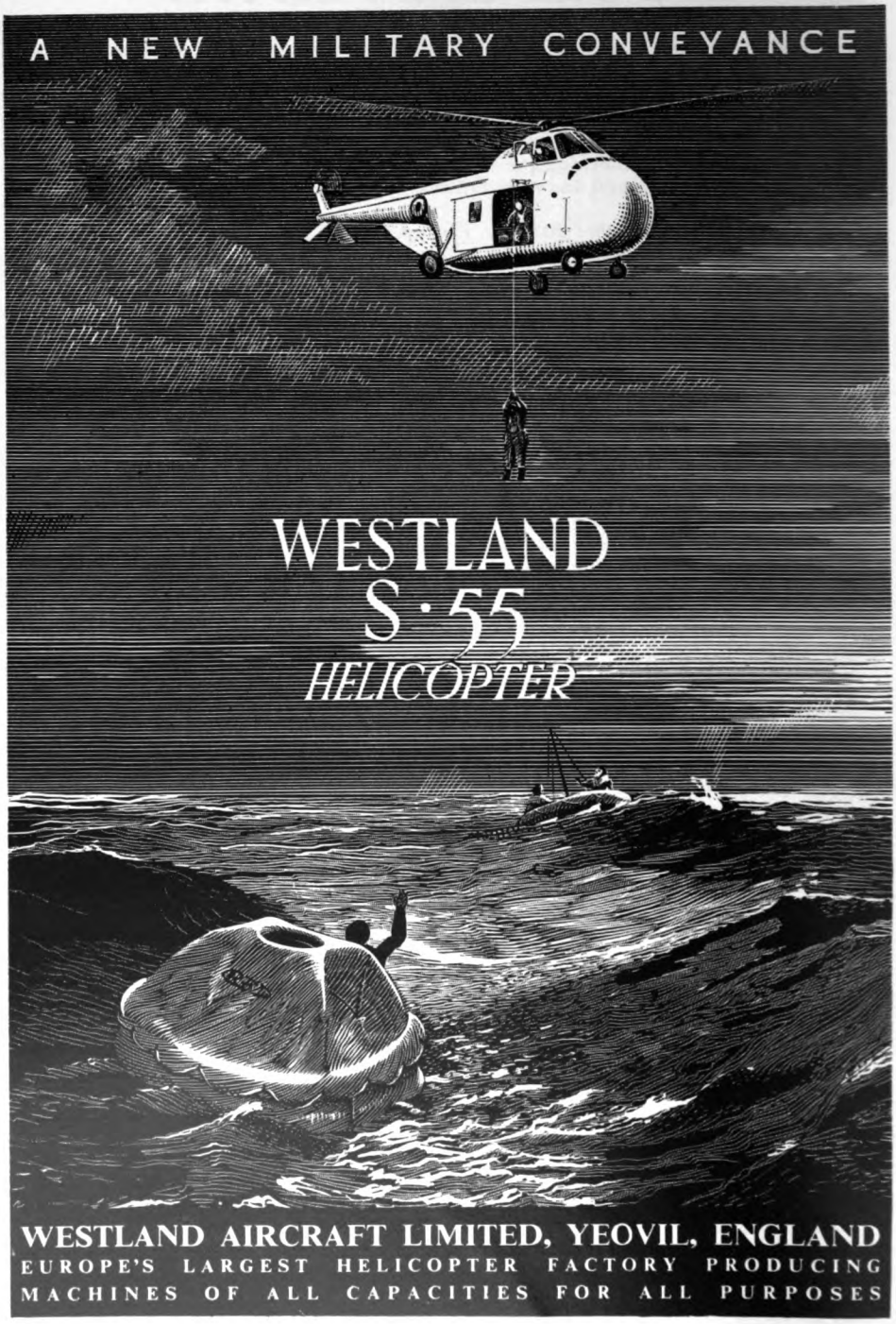

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Calculated Risk. By General Mark Clark. Published by George G. Harrap & Co. Ltd., 182 High Holborn, London, W.C.1. 462 pp. and index. Illustrated. 22s. 6d.

General Mark Clark is Chief of the U.S. Army Field Forces and his views on air power, as put forward in this personal history of the Mediterranean War, from the invasion of French North Africa to the occupation of Austria by way of Sicily and Italy, are therefore of the greatest interest and importance.

The reader is left in no doubt, even for a moment, that General Clark is an Army man through and through. He believes that all matters affecting the Army should be under its direct control, including amphibious landings and air support. In particular, he expresses concern at the belief that the U.S. Air Force regards strategic bombing as being more important than close support of ground forces.

"I do not mean to imply by this observation," he states, "that in the fighting in Italy we were not given splendid air support of all kinds by both British and American planes. Nevertheless, the command arrangements were never satisfactory from my point of view, and they are still not satisfactory at the present time, over five years after the end of the war. I believed then, and my experiences in Italy did not change my view, that ground troops cannot be successful in battle unless adequately supported by combat aviation, and that such planes as are used for this purpose are necessarily auxiliary weapons, as is the artillery, and that they should come under the direct orders of the ground commander. That, in a sentence, is still my belief today."

General Clark amplifies this later by remarking: "My belief is that a single command should be established over all three arms, in somewhat the same way as the Russian air forces are usually employed under the operational command of the army group commander." And he quotes mistakes made at Salerno, under three-Service command, to support his case.

Certainly his Fifth Army had plenty of excuse to feel they were being let down by the Allied Air Forces in the early stages of the Italian campaign, especially at Anzio, where the air components failed in their objective of isolating the beach-head area by smashing enemy lines of supply. But the man on the ground seldom appreciates the difficulties of operating warplanes hundreds of miles from their bases in bad weather, and General Clark seems to have had no better appreciation of this problem than most of his men.

He does admit towards the end of the book, however, that "The Air Force played a tremendous role in the victories that led to the liberation of Rome, not only disrupting the enemy's reinforcements from the north, but, in the final phase, raining countless blows on his retreating columns. The loss in material, as well as men, was all but fatal to Kesselring, and would have meant his complete defeat if a powerful force had been permitted to follow through in the attack."

But this was not possible, as much of the Fifth Army's strength had been drained off to support the invasion of Southern France, and, with heavy battles raging in Northern Europe, the Italian Front was low on the priority list for reinforcements. But for that fact, this great Army of men from a dozen Allied nations would probably have swept through Italy to Austria and the Balkans in advance of the Red Army, and the whole post-war political scene in Eastern Europe might well have been vastly different.

J. W. R. T.

Fellowship of the Air: Jubilee Book of the Royal Aero Club, 1901-1951. By B. J. Hurren. Published for *Flight* by Iliffe & Sons Ltd., Dorset House, Stamford Street, London, S.E.1, on 7th September, 1951. Size, 9⅞ in. x 7½ in. 234 pp. plus 32 pages of plates. Cloth bound with jacket. 30s. (postage 9d.).

The Royal Aero Club of the United Kingdom, which celebrates its fiftieth anniversary on 31st October, has been closely bound up with the development of flying since the earliest days, so much so that the story of the Club is to a large extent the story of private and sporting aviation in Britain.

Fellowship of the Air, published especially to mark the occasion of the Club's jubilee, tells a remarkable story in full and fascinating detail. It starts on a far-off afternoon in 1901, long before the first powered machine had ever left the ground, when a young woman riding in a balloon high over the English countryside impulsively proposed the founding of the Club. After that strange and fateful beginning, we meet the elegant aeronauts of the Edwardian heyday whose balloon ascents were a society occasion, part of the glittering social scene. Then, heralding the new era of the aeroplane, the Wright Brothers and the great British and French pioneers of aviation come striding on to the stage. The fabulous

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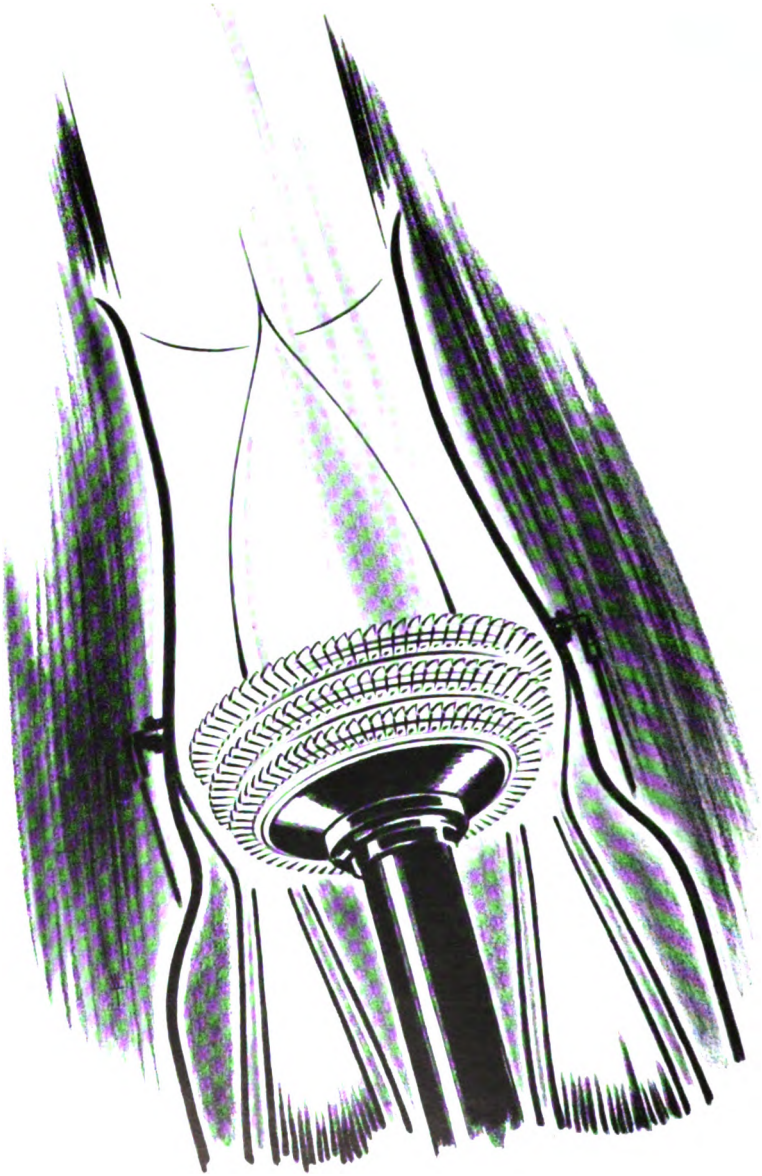

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stories of the early flights of those pioneers are recounted, with much new light thrown on them as the result of patient research in the Club's own records—for the Royal Aero Club played a prominent part in almost all those historic occasions.

It is a flowing narrative of very great achievement; of the vision, courage and determination of a group of men and women whose work over fifty crowded years has helped to keep Britain to the forefront in the air. Fittingly, there is an introduction by one of the greatest of all pioneers of flying, Lieutenant-Colonel Lord Brabazon of Tara, P.C., M.C., holder of the first pilot's certificate ever issued in Britain, and today President of the Royal Aero Club.

Charles Rolls (of Rolls-Royce fame), the brilliant engineer, "Colonel" Cody, the flamboyant American whose daring flights made him a British national hero, Grahame-White, Handley Page, Sopwith, A. V. Roe, Bleriot, Paulhan, Farman—such names, now world-famous, throng these pages. Then came the First World War and the vast development of the aircraft industry that resulted. There followed the years between the wars, years of ever-increasing mastery of the new element. The dramatic part that the Club played in the Schneider Trophy races is recalled, as are the epic flights of the twenties and thirties, originally inspired by the Atlantic crossing of Alcock and Brown and made by Lindberg, Bert Hinkler, Jim Mollison, Alan Cobham, Amy Johnson, Jean Batten and many more. And so to the Second World War, with the Club's role in this new war in the air, to be followed by its work of reconstruction in the field of private and competition flying.

NEW BOOKS

BIOGRAPHY

Chief of Intelligence. (An account of Admiral Canaris, Chief of the German Intelligence Service before and during the Second World War.) By I. Colvin. (Gollancz, London, 1951; 12s. 6d.).

Two Frenchmen. (Pierre Laval and Charles de Gaulle.) By D. Thomson. (Cresset Press, London, 1951.)

Memoirs of Ernst von Weizsaecker. (Head of the German Foreign Office, 1938-1943.) By E. von Weizsaecker. (Gollancz, London, 1951; 16s.)

POLITICAL

Ideas and Ideals of the British Empire. (A critical examination of the contribution made by the Empire to the political progress of mankind.) By Sir E. Barker. (Cambridge University Press; 2nd Edition, 1951; 5s.)

Britain and the Middle East, from the Earliest Times to 1950. By Sir R. Bullard. (The author was first H.M. Minister, and later Ambassador, to Persia from 1939 to 1946.) (Hutchinson, London, 1951; 7s. 6d.)

Peace Can be Won. By P. Hoffman. (The author was formerly Administrator of the Marshall Aid Plan.) (Michael Joseph, London, 1951; 8s. 6d.)

Conditions of Freedom. (The Chancellor Dunning Trust Lectures, delivered at Queen's University, Kingston, Ontario, in 1949, by the Professor of Moral Philosophy at the University of Edinburgh, on the theme of the freedom and responsibility of the individual in our modern society.) By J. Macmurray. (Faber, London, 1950; 6s.)

Red Storm Over Asia. By R. Payne. (Macmillan Co., New York, 1951; $5.00.)

Current Developments in United States Foreign Policy. (A Summary of Events during April, 1951.) (Brookings Institution, Washington, D.C.; 60 cents.)

Russia by Daylight. By Edward Crankshaw. (Michael Joseph, London, 1951; 15s.)

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POLITICAL PHILOSOPHY

Restatement of Liberty. By P. C. Gordon Walker. (The author is Secretary of State for Commonwealth Relations. The book is an exposition of a political philosophy that challenges both liberalism and communism, and an examination of the main practical problems of contemporary society.) (Hutchinson, London, 1951; 21s.)

WARFARE

This War Business. (The economics of modern warfare in terms of the use and wastage of men, money and materials; with some suggestions for the achievement of a lasting peace.) By A. G. Enock. (John Lane, The Bodley Head, London, 1951; 18s.)

War and Civilization. (A selection of passages from the six volumes of "A Study of History," considering the problem of war, as it has recurred throughout the history of civilization.) By A. J. Toynbee (Edited by A. V. Fowler). (Oxford University Press, 1951; 10s. 6d.)

Military Science Today. By Colonel D. Portway. (The author is Master of St. Catherine's College, Cambridge.) (Oxford University Press, 1951; 7s. 6d.)

Military Management for National Defence. (A plan for the attainment of the highest degree of efficiency in the administration of armed forces, based on the most successful practices of American business management and the best traditions of American military organization.) By Colonel J. R. Beishline. (Prentice-Hall, New York, 1950; $5.00.)

We Defended Normandy. By Lieut.-General H. Speidel. (The author was formerly Field-Marshal Rommel's Chief of Staff.) (Jenkins, London, 1951; 12s. 6d.).

ARTICLES OF INTEREST IN CURRENT PERIODICALS

"Military Review" (Command and General Staff College, Kansas)
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June, 1951, "Ministry of Materials"; 23rd June, 1951, "Two Kinds of Inflation"; 16th June, 1951, "South of the Soviets (The Middle East Problem)."

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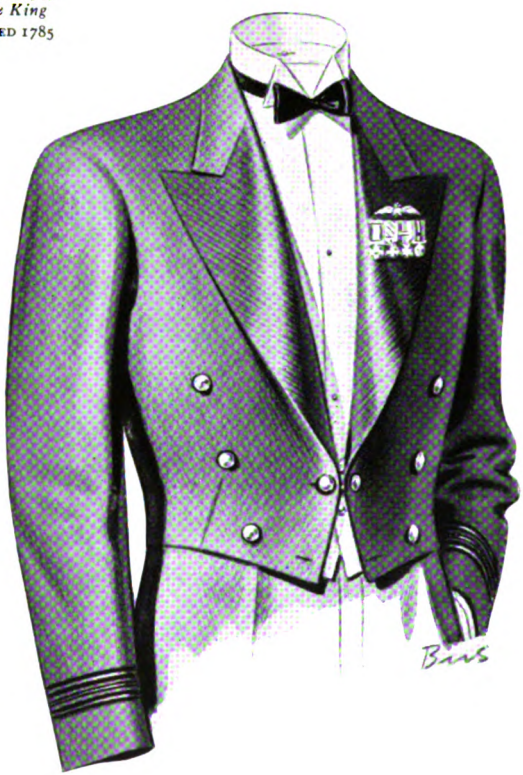

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CONCERNING PERSONNEL

ROYAL AIR FORCE PROMOTIONS AND APPOINTMENTS

Among the promotions and appointments announced by the Air Ministry since the issue of the July, 1951, number of this Journal, are the following:

H.R.H. THE PRINCESS ELIZABETH TO BE HONORARY AIR COMMODORE

Her Royal Highness The Princess Elizabeth has graciously accepted the appointment as Honorary Air Commodore of the No. 603 (City of Edinburgh) Squadron, Royal Auxiliary Air Force, No. 2603 (City of Edinburgh) Squadron, Royal Auxiliary Air Force Regiment, and No. 3603 (City of Edinburgh) Fighter Control Unit, Royal Auxiliary Air Force.

His Majesty The King has approved the appointment.

This appointment of Princess Elizabeth, Duchess of Edinburgh, as Honorary Air Commodore of the City of Edinburgh Auxiliary Units strengthens the close association already existing between the Royal Family and the Royal Auxiliary Air Force. The King is Air Commodore-in-Chief of the Royal Auxiliary Air Force, a position he has held since December, 1936, when it was then the Auxiliary Air Force.

The Queen has been Honorary Air Commodore of No. 600 (City of London) Squadron, Royal Auxiliary Air Force, and No. 2600 (City of London) Squadron, Royal Auxiliary Air Force Regiment, since August, 1949.

The Duke of Gloucester is Honorary Air Commodore of No. 501 (County of Gloucester) Squadron, Royal Auxiliary Air Force, and No. 2501 (County of Gloucester) Squadron, Royal Auxiliary Air Force Regiment.

INSPECTOR-GENERAL OF THE ROYAL AIR FORCE

Air Marshal Sir Thomas M. Williams, K.C.B., O.B.E., M.C., D.F.C., as Inspector-General of the Royal Air Force, in place of Air Chief Marshal Sir James M. Robb, G.C.B., K.B.E., D.S.O., D.F.C., A.F.C.

AIR MINISTRY

Air Vice-Marshal G. W. Tuttle, C.B., O.B.E., D.F.C., as Assistant Chief of the Air Staff (Operational Requirements).

Air Commodore G. P. O'Connell, M.B., B.Ch., as Deputy Director-General of Royal Air Force Medical Services.

Air Commodore R. C. Field, as Director of Administrative Plans.

Air Commodore George Scarrott, C.B.E., as Director of Mechanical Transport and Marine Craft (a newly created post at the Air Ministry).

Air Commodore H. J. Butler, C.B.E., as Director of Equipment (B).

BOMBER COMMAND

Air Vice-Marshal W. A. D. Brook, C.B., C.B.E., as Air Officer Commanding No. 3 Group.

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FLYING TRAINING COMMAND

Air Vice-Marshal A. McKee, C.B., C.B.E., D.S.O., D.F.C., A.F.C., as Air Officer Commanding, No. 21 Group.

Air Commodore Sydney Richard Ubee, A.F.C., as Commandant of the Royal Air Force Flying College at Manby.

Air Commodore Anthony Dunkerton Selway, D.F.C., as Commandant of the Royal Air Force Central Flying School.

Air Commodore A. F. Cook, O.B.E., as Principal Medical Officer, Flying Training Command.

HOME COMMAND

Air Vice-Marshal C. A. Stevens, C.B., C.B.E., M.C., as Senior Air Staff Officer.

TRANSPORT COMMAND

Air Commodore Walter Howard Hutton, C.B.E., as Senior Air Staff Officer, Transport Command.

NORTHERN IRELAND

Air Commodore H. J. G. E. Proud, as Air Officer Commanding No. 67 (Northern Ireland) Group, and Senior Air Officer in Northern Ireland.

MIDDLE EAST

Air Commodore J. E. R. Sowman, as Senior Equipment Staff Officer, Headquarters, Middle East Air Force.

FAR EAST

Air Commodore F. E. Lipscombe, M.R.C.S., L.R.C.P., D.P.H., D.T.M. & H., as Principal Medical Officer, Far East Air Force.

B.A.F.O., GERMANY

Air Marshal Sir Robert M. Foster, K.C.B., C.B.E., D.F.C., as Commander-in-Chief, who takes up his appointment in October, 1951.

Air Vice-Marshal Sir Harry Broadhurst, K.B.E., C.B., D.S.O., D.F.C., A.F.C., to command pending Air Marshal Foster's arrival.

Air Commodore Hector Douglas McGregor, C.B.E., D.S.O., as Air Officer Commanding No. 2 Group.

AUSTRALIA

Air Vice-Marshal Gilbert Harcourt-Smith, C.B., C.B.E., M.V.O., as Head of the United Kingdom Service Liaison Staff.

R.A.F. CENTRAL MEDICAL ESTABLISHMENT

Air Commodore C. A. Rumball, O.B.E., as Consultant in Medicine.

ROYAL AIR FORCE HONORARY SURGEON TO THE KING

Air Vice-Marshal W. E. Barnes, C.B.E., M.R.C.S., L.R.C.P., D.T.M. & H., as Honorary Surgeon to His Majesty The King.

RETIREMENTS

Air Vice-Marshal F. J. Murphy, C.B., C.B.E., M.B., B.Ch., D.P.H.

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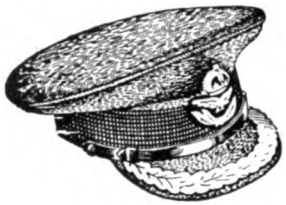

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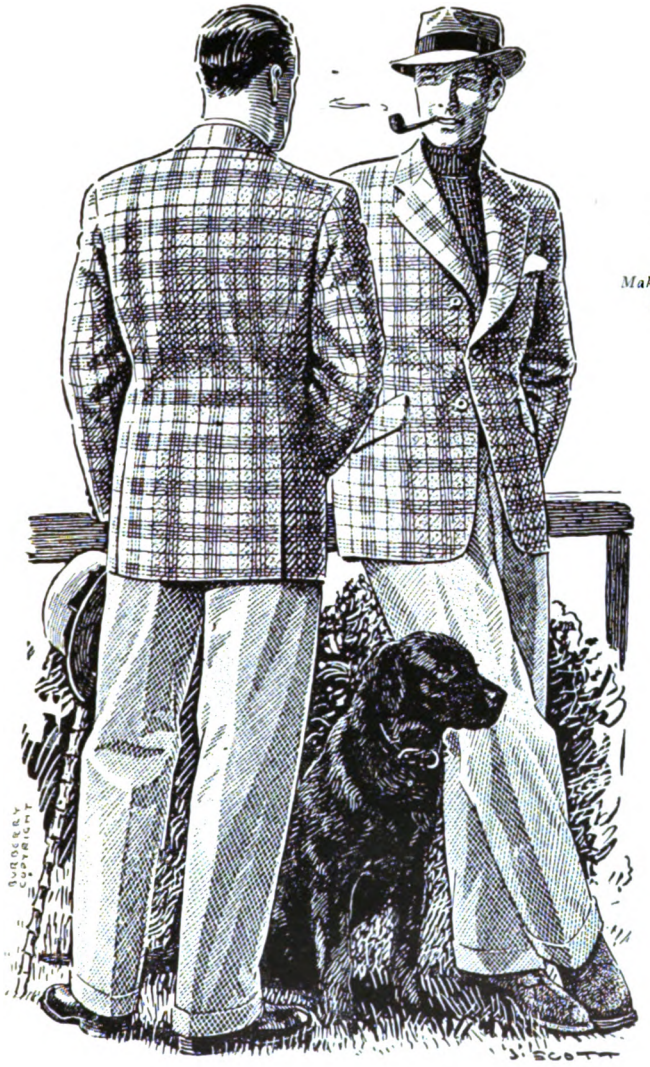

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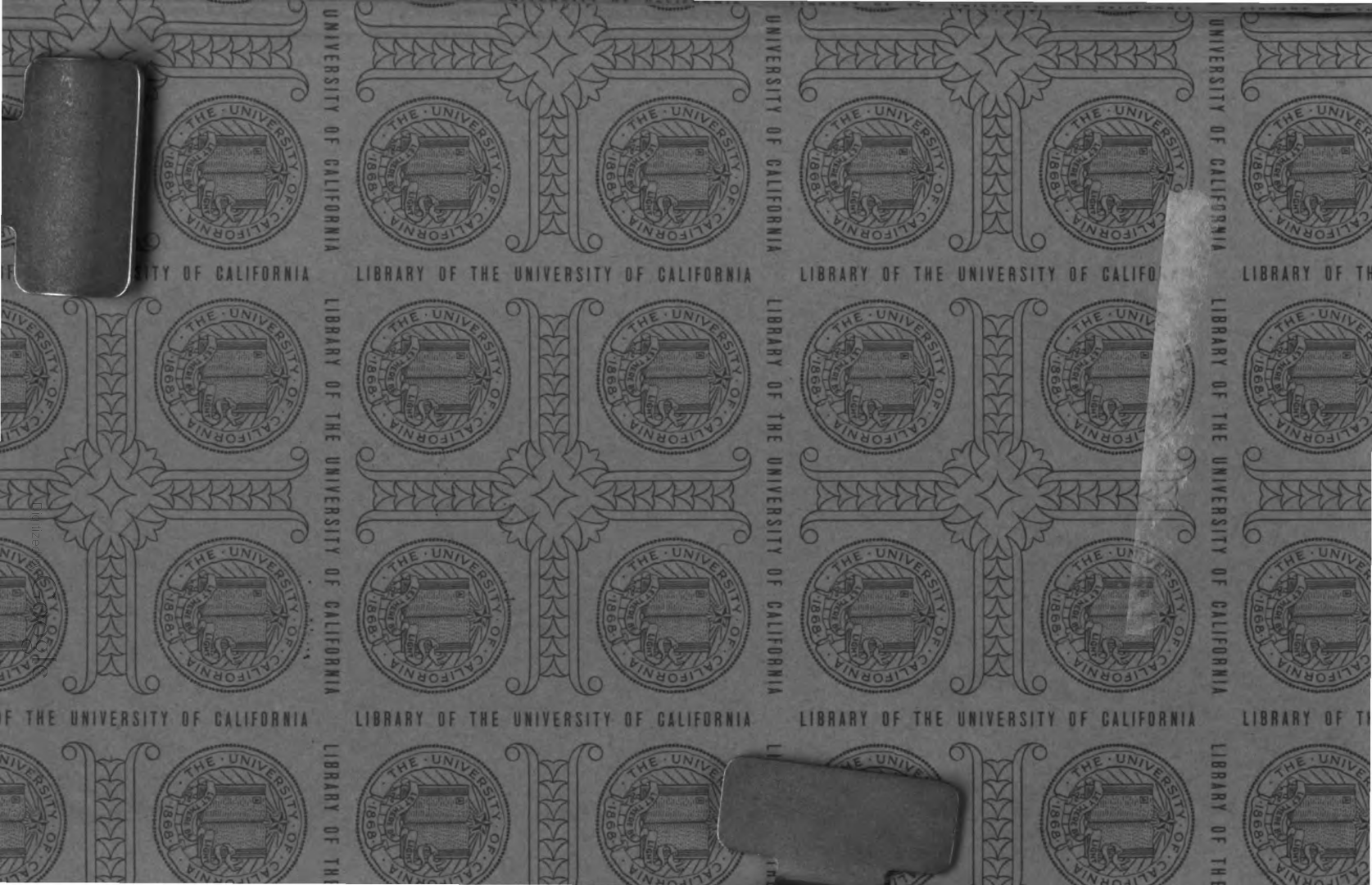
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